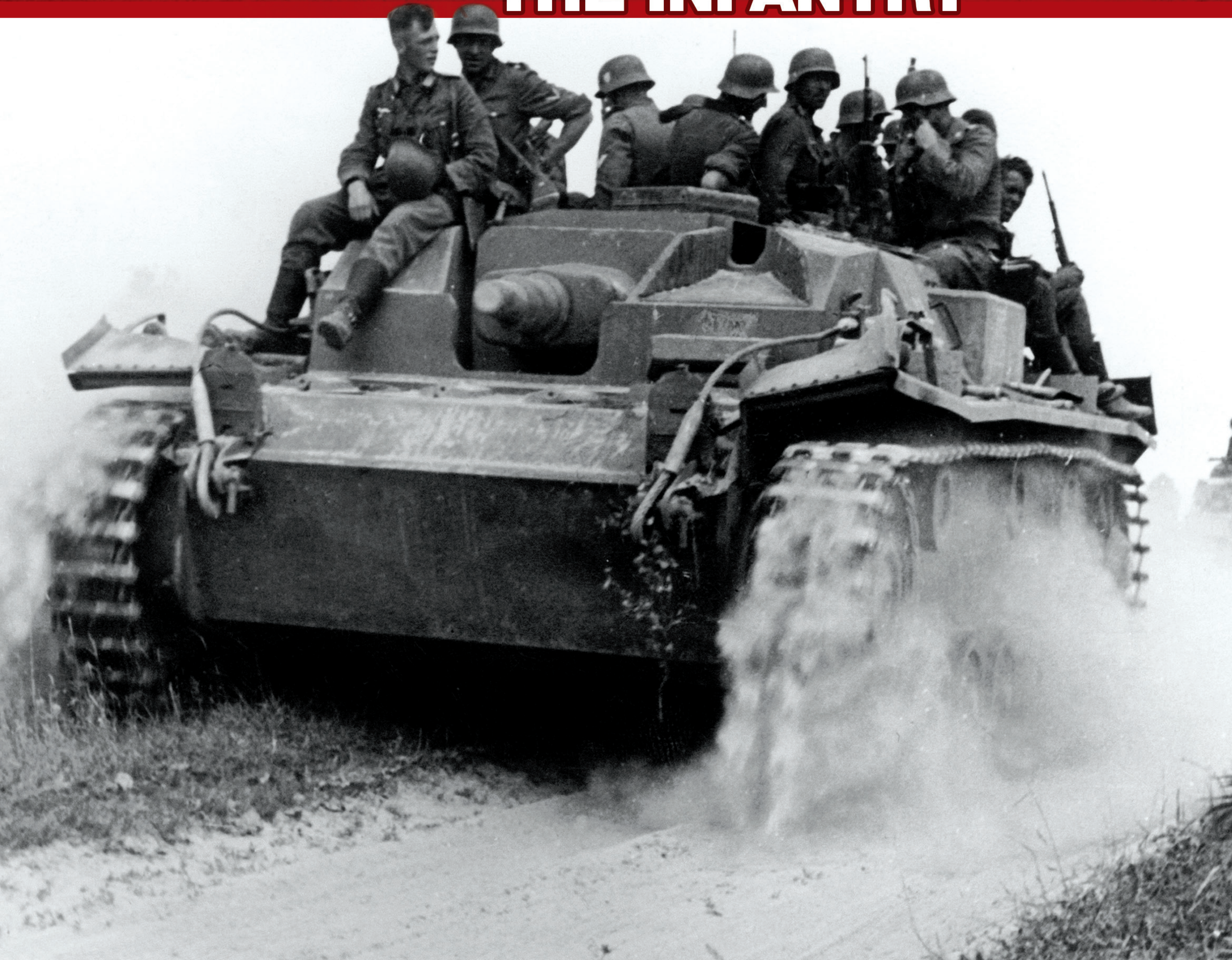
Thomas Anderson

Sturmartillerie

SPEARHEAD OF THE INFANTRY



STURMARTILLERIE

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ARTILLERIE

Thomas Anderson

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Introduction

This renowned branch of the German military machine, the *Sturmartillerie* (assault artillery), was established only a very short time before the outbreak of World War II. Their weapon, the *Sturmgeschütz*, was designed to provide support for an attacking infantry division. After trialling tactics during the initial phase of the war using units each equipped with six assault guns, larger formations began to be deployed from late 1940. The true baptism of fire came when *Unternehmen* (Operation) *Barbarossa*, the ill-timed (and ill-fated) invasion of the Soviet Union was launched: Here *Sturmgeschütz* had to prove their value in the wide-open terrain of Russia. Led by highly trained officers and non-commissioned officers (NCOs) using superior tactics, *Sturmgeschütz* units celebrated many incredible successes.

But, there always is another view of the facts. In the later stages of World War II, the *Sturmgeschütz* had to be used in an attempt to halt the vast numbers of Soviet tanks advancing toward the borders of the Reich. Would the *Sturmgeschütz* still be of value on other battlefields in 1944: *Operatsiya* (Operation) *Bagration* (22 June – 19 August 1944) and Operation *Overlord* (6 June 1944).

Not surprisingly, there are (and have been) many publications on the *Sturmgeschütz/Sturmartillerie*, and generally the reader will find many of these filled with contemporary photographs and colour artworks only – but very few substantiated facts. The content of any such book is normally based on information gained from secondary literature or, very occasionally, on personal experience.

In the past, respected authors including Walter Spielberger, Tom Jentz, Hilary Doyle and Peter Müller have more than adequately covered the 'nuts and bolts' and production details of the subject.

I have always been fascinated by the epic story of the *Sturmartillerie*. This interest led me to making contact with members of the *Gemeinschaft der Sturmartillerie* (community of the assault artillery – surviving veterans), who gathered regularly until 2010 when the meetings stopped due to a dwindling

A *Sturmgeschutz* Ausf B of StuGAbt 184 is driven through a shallow ditch during a training exercise. A careful reconnoitre of the terrain was essential, as even such a small obstacle could affect an assault. (Anderson)

Soldiers of the *Reichswehr* man a *Maschinengewehr* (MG) 08/15, during an exercise in the inter-war years. The large-scale introduction of the machine gun by all combatants before outbreak of World War I totally changed infantry warfare. (NARA)

attendance. However, I do remember having many interesting conversations, during which I gathered much valuable information. However, personal recollections, as interesting they may sound, should be considered with caution. Also, I learned these should never be regarded with more importance than the unbiased, objective facts to be found in archives.

I have come to the conclusion that now is the time to examine the *Sturmartillerie*, its origins and tactical and technical performances in more detail and tell the complete story, from the very beginnings at Jüterbog (near Berlin) through to the epic battles on the *Ost* (east) front, those in Italy and on to the D-Day landings and the final desperate defence of the Reich. This journey will describe the initial impact of this elite branch of the artillery, from incredible achievements in battle to the final deployments of *Sturmgeschütz* as, basically, cannon fodder.

Sturmgeschütz – Support for the Infantry

The industrial revolution of the mid-19th century influenced warfare with increasing rapidity. A completely new type of industry emerged as heavy engineering manufacturers began designing and producing new and sophisticated weapons. Sir Hiram Maxim had designed the machine gun and the large-scale introduction of modern artillery weapons with a recoil mechanism revolutionized warfare to an extent that, at that time, would not have been considered possible. The establishment of railway networks across Europe revolutionized transport: the more rapid movement of troops with their equipment (and keeping them supplied) over large distances was now possible.

These sophisticated weapons were used in the battles of World War I, and made old-style tactics ineffective. The high firepower of the machine gun and the increased accuracy of artillery made any decisive infantry assault or cavalry charge impossible: the result was a four-year stalemate. Despite this fact, senior officers on both sides continued to commit tens of thousands of infantry soldiers into the battle. In 1919, General Edmond Buat, who became Chief of the General Staff of the French armies in 1920, wrote:

> Of the two main elements of battle tactics, so far only one has benefited from technical progress – artillery. This benefit is so huge, that all movement ceased almost totally. Attacks by cavalry are neutralized almost completely. The infantryman on the front line is forced to dig himself into a ground position and advance only when all enemy artillery has been silenced. Now, with the advent of the combustion engine [in tanks], movement will regain its full importance.

In his book *Die Panzertruppen*, General Heinz Guderian further refined these thoughts with forceful logic:

> The armour, driven by engine power, protects the ordnance and the crew to a great extent. Armour, mobility and firepower are the essential characteristics of the new ground-attack weapons.

The western allies were the first to find a way out of this dilemma. Britain and France developed the tank, which appeared on the battlefield for the first time on 15 September 1916. Allied armies, now able to overcome the machine gun, used the tank in large numbers (400 were deployed to break through the Amiens line on 8 August 1918), and by the end of the war some 6,000 had been produced. After the war, tank design was further advanced, as new ideas and technology were tested.

During the course of World War I, the German Reich was unable to follow this technical progress and, apart from some *Beutpanzer* (captured) Allied tanks, a total of only 20 tanks were manufactured in Germany.

After the war, this first *Panzerschreck* (tank shock) continued to have an effect in Germany, but Panzers (tanks) had now become an important part of future military planning. However, the Treaty of Versailles did not allow the defeated Reich to progress with development of the tank nor other modern military equipment. However, new German tank designs were developed and tested in the strictest secrecy.

Heinz Guderian was one of the most ardent protagonists for the tank. He, supported by General Lutz (inspector of motorized troops), developed the basic tactics and organization for what would become the *Panzerwaffe* (tank force).

In 1936, Guderian noted in several of his essays, published in military journals (later combined in *Die Panzertruppen*), a fundamental problem he faced. At the time this question was essential for the armed forces of any other nation:

> Cooperation with other elements of the military:
>
> With the birth of the new weapon [the tank], the question of the cooperation between the *Panzertruppen* and other branches is most contentious and hotly disputed. Two absolutely divergent concepts struggle for dominance.
>
> The protagonists of the 'old school' regard the infantry as the main force, the sole 'monarch of the battlefield', which should be supported by all other branches as subordinated auxiliary forces… In this scenario the tank should not travel faster than the slowest marching, or sometimes, (for a short distance) the running infantry. The tank should be an armoured shield for the infantry, which is unable to attack in the face of machine guns protecting the enemy's lines.
>
> However, the protagonists tend to overlook or ignore the advantages given by the extreme mobility of the tank. The slow pace of out-dated attack methods will allow any defender to quickly establish a new front behind the point of breakthrough.

Guderian and Lutz were finally successful in pushing through their theory. History would show that the concept of the *Panzerwaffe* proved to be superior to the thinking of the traditional military.

However, their revolutionary ideas saw the value of the infantry downgraded. Once at the forefront of an attack, the infantry were now subordinated under the *Panzerwaffe*. This applied at least on the front line when preparing for a break-through attack. Here, however, a fundamental mistake in their planning occurred. Although the tank was an effective weapon, they were available in limited numbers which severely restricted their deployment in support of an infantry assault.

On a front-line area where no tank units were available, the infantry would be in almost the same situation as in 1915. How would the attacking infantry react when suddenly faced with enemy tanks or dug-in machine-gun positions without mobile armoured support? How would infantry in defensive positions launch a counterattack?

However, the British army continued to use the tank to support the slow-moving infantry in principle, a repetition of World War I combat methods.

Erich von Manstein – the Final Call for a Solution

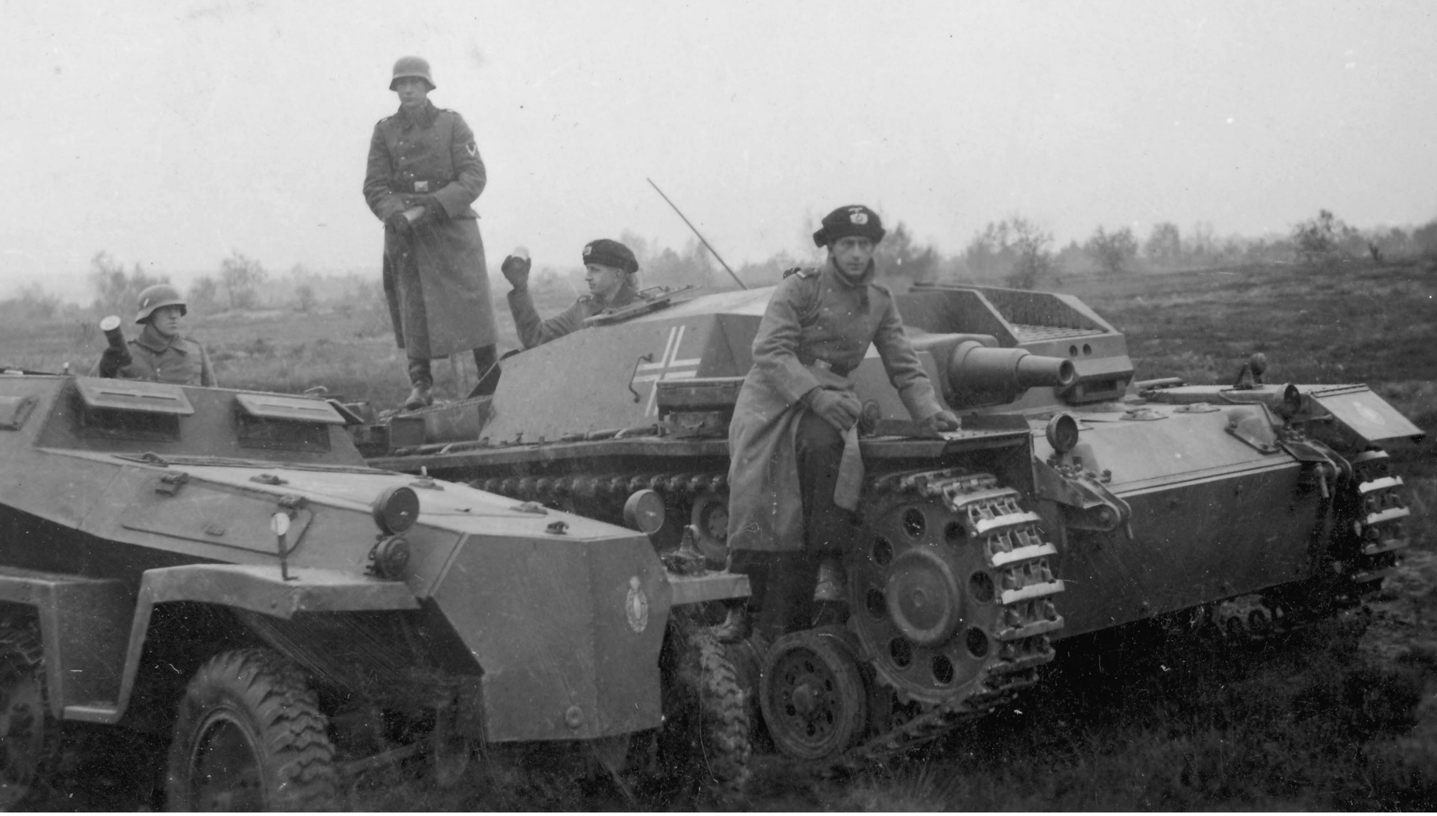
In 1935, Erich von Manstein, an infantry colonel, led the call for a specialized support weapon for the infantry. As an infantry specialist, his experiences in World War I were built on a certain superiority of a defender´s position during an attack, where even a few remaining machine-gun positions could effectively bring even a large-scale assault to a halt. In 1918, *Begleitbatterien* (horse-drawn artillery batteries) were established to overcome this problem. These highly-mobile units were to escort the attacking infantry and be almost instantly ready to attack and eliminate enemy machine guns and artillery.

A gun team mans a 7.5cm *Feldkanone* (field gun) NA, during a pre-war *Reichswehr* exercise. Although the light artillery piece was used in World War I, it was extensively used to equip escort batteries, which were established in 1939 to assist the attacking infantry. (NARA)

Less than 20 years later, *Oberst* (Colonel) von Manstein called for a more sophisticated solution. He reasoned that, in the times of the mobile warfare, German light artillery would not be able to effectively assist the infantry. Suddenly emerging targets could not be quickly engaged and destroyed, as it took too much time for the artillery to get into a firing position. The *Sturmgeschütz*, which had to follow the advancing infantry closely, should be an open-topped *Selbstfahrlafette* (Sfl – self-propelled [SP]) gun. To keep the weight of the vehicle within reasonable limits, an armoured cover for the crew was considered unnecessary, which was dangerous but it did allow them a very good view. Since the gun only had to be fired forward, a rigid mounting was chosen, thus dispensing with a rotating turret. *Oberst* von Manstein claimed that an infantry division should be supported by one *Sturmgeschütz-Abteilung* (assault artillery battalion). While his ideas were widely accepted by the infantry and artillery, his ambitious plans could never be realized to their full extent.

On 8 June 1936, the *General der Infanterie* forwarded his basic thoughts on an integrated support weapon for the infantry divisions to the *Generalstab des Heeres* (GenStbH – General Staff of the Army):

> To the Honourable *Chef des Generalstabes* (Chief of the General Staff).
>
> Since the basic idea of creating the armoured assault artillery has gained the approval of the Honourable *Chef des Generalstabes*, it is now necessary to establish the rules for tactical deployment along with the technical development of the *Sturmartillerie*. Otherwise we will have a weapon at hand, which no one will know how to use effectively.



Jüterbog was the home of the *Sturmartillerie*. Here, on the extensive training grounds, basic tactics were trialled. The *Sturmgeschütz* is being replenished with ammunition from an SdKfz 252 *Munitionswagen* (ammunition carrier). Both vehicles carry the distinctive badge of the *Artillerie-Lehr-Regiment* (ALR). (Anderson)

Also, it should be noted that at present in many other countries there is the same confusion between the tasks of the *Panzerwaffe* (combat tanks) and the *Sturmartillerie* (infantry tanks)… On the one hand, tanks shall be used to break through the lines of the enemy infantry by making full use of their speed to destroy his artillery, reserve and command echelons. On the other hand, the tanks shall not lose touch with our infantry in order not to endanger the ground gained by their attack. Tank commanders tend to be of the opinion that the infantry has to keep pace with them, which is absolutely impossible. The infantry commanders want to keep at least one wave of tanks under their control. In doing so, the tanks would lose the advantage of speed and thus their main protection against the enemy artillery (anti-tank guns).

We wish to make it clear that the *Panzerwaffe* and the *Sturmartillerie*, although technically similar, are totally different weapons in regard to their tactical deployment.

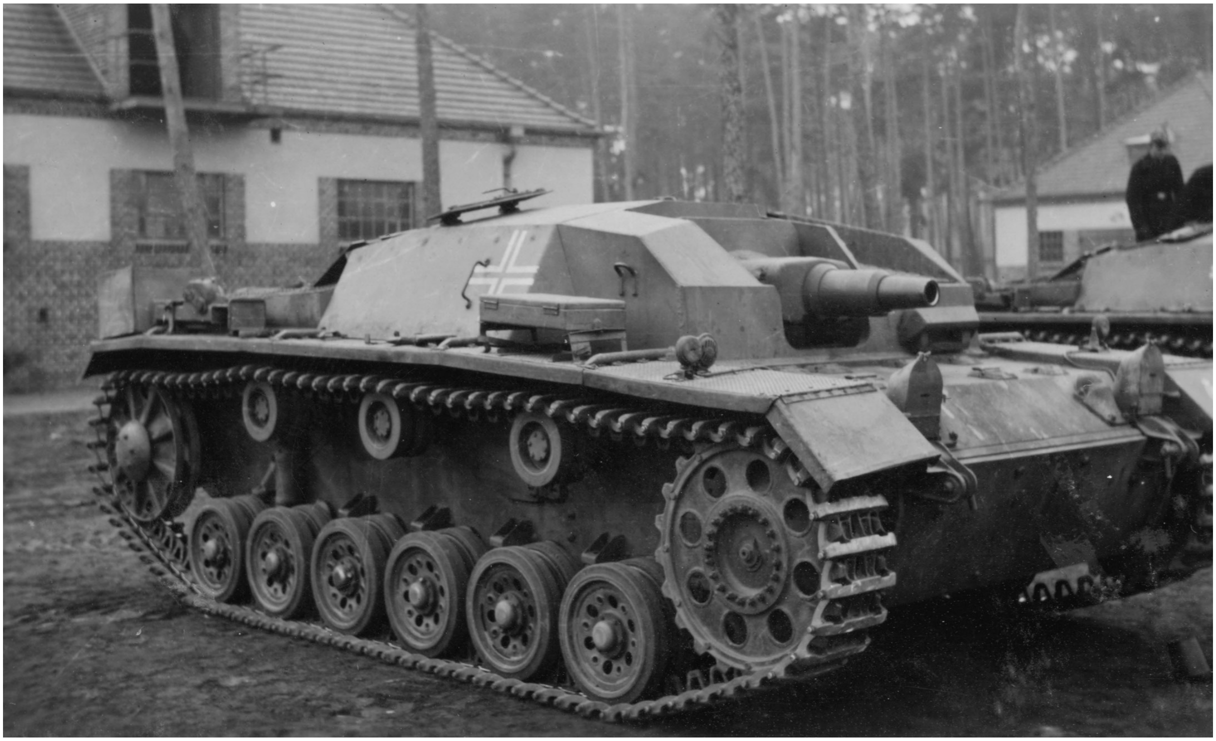
To clarify:

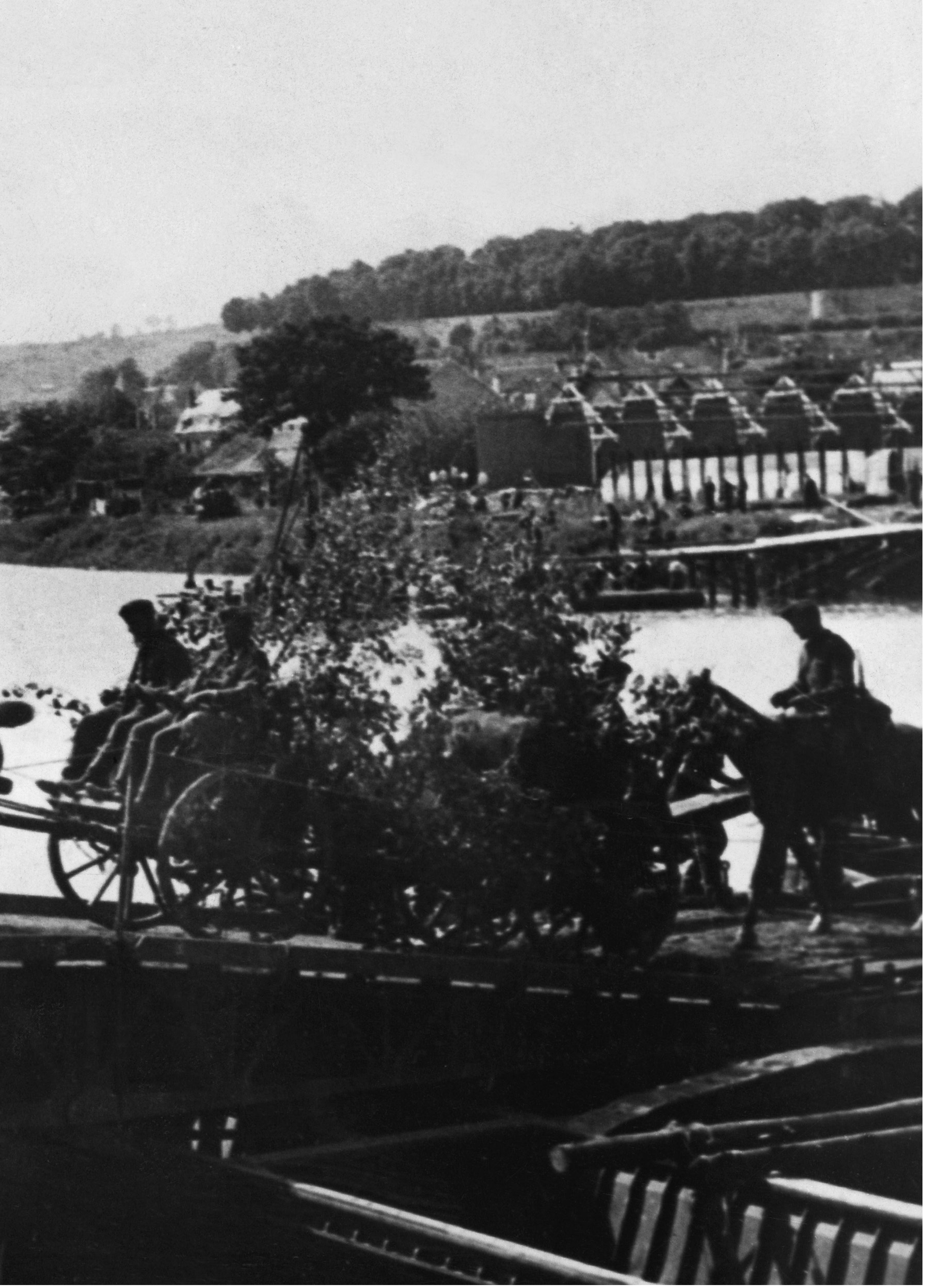
I.) Panzer units are mixed formations of several services, whose composition allows for autonomous combat and fulfillment of dedicated missions. Although a Panzer unit primarily relies on the tank, it does have motorized artillery to assist in the attack, motorized infantry to exploit any gained territory and other specialist troops under its command. Tank units detailed for independent combat missions will be committed for decisive attacks; where possible these will be against the flank or rear of the enemy. Also they can be assigned with the task of breaking through the enemy´s front-line defences. In each case they will have to attack independently. The tank unit´s ability to attack is significantly limited by the terrain… However, tank formations will not be successful in an attack against well-fortified enemy front-line positions. In contrast, their impact can be decisive if they hit the enemy at its weakest point, or if they surprise him before he can get ready for combat. Their commitment within the rapid forces (*schnelle Division-Panzerdivision*) appears to be most promising.

II.) Panzer Brigades, pure tank formations, will be used at the points of main attack… In contrast to *Panzerdivisions*, they will not fight independently but will be joined to an infantry division attacking the main target.

III.) The *Sturmartillerie*, equally whether it will be provided with tanks or self-propelled guns, is a support weapon of the standard infantry division. It will be used in the same manner as the escort batteries (the elite of the light artillery) in the last war. To enable the *Sturmartillerie* to conduct further duties, especially in defence, we demand that it has to be used also to assist the divisional artillery. Thus the option to conduct indirect fire, at a maximum range of 7km, has to be permitted. Finally, the assault artillery will be an excellent weapon for defence against mobile anti-tank guns. The *Sturmartillerie* fights as escorting artillery within the framework of the infantry. It does not attack in the same way as the combat tank; it will not break through, but will push forward the infantry attack by rapidly eliminating the most dangerous targets. The *Sturmartillerie* will not fight in numbers as the tank

A *Sturmgeschütz* Ausf A parked in the technical sector of the Jüterborg garrison. The vehicle is one of the few built on a PzKpfw III Ausf E chassis taken from the production line. Note the extra armour on the front of hull and the escape hatch in the side of the hull. Most *Sturmgeschütz* from this production run were only used for training purposes by the ALR. (Zimmermann)





Horse-drawn artillery attached to 16th Army cross the river Meuse (Maas) at Stenay, north of Verdun, on 15 June 1940. Retreating French forces destroyed the bridge, but German engineers have assembled a pontoon bridge as a replacement. (Getty)

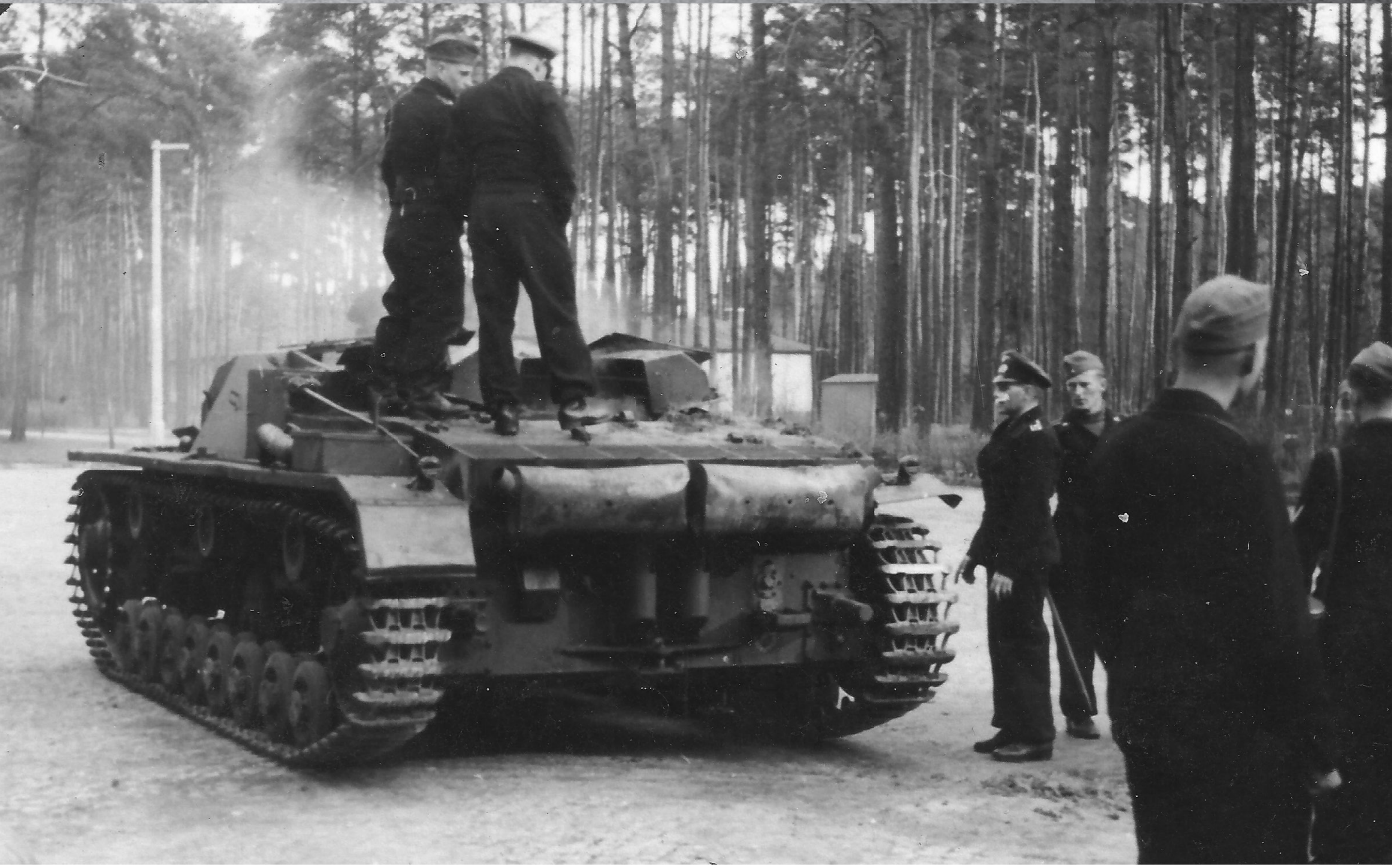
> unit will do, it will normally be deployed in platoon strength. The platoon or even a single assault gun will arrive suddenly, and then disappear just as quickly so as not to become a target for enemy artillery.
>
> It follows from the above, that tactical training for the *Sturmartillerie* cannot be conducted by units of the *Panzertruppe*, but only by dedicated infantry units. A strict separation of these units is necessary, as their tactical principles are completely different.
>
> Request:
> To evaluate tactical methods, we request the establishment of an improvised *Sturmartillerie* battery for trial purposes. To save time, this should happen promptly by bypassing all official channels. An allotment of six vehicles for this battery will be sufficient. Light tanks fitted with a dummy wooden superstructure would be suitable to achieve our purpose of developing tactical techniques.

A week later, on 16 June 1936, 2.GenStbH (2nd Department of the General Staff of the Army) answered in a memorandum:

> 1.) We agree on the technical development of a *Sturmgeschütz* and on its tactical commitment.
> 2.) It seems necessary to point out the following distinctive features to the divisional artillery in order to give the *Waffenamt* (ordnance bureau) simple and clear demands for the development of the assault gun:
> a) The task of the *Sturmartillerie* is to destroy enemy machine-gun (MG) positions. This task will be performed within the scope of the infantry attack and at firing ranges of maximum 4km. Thus it is a weapon of the infantry, and has not to perform artillery duties. Therefore, there is no need for shooting ranges of 7km or being fitting with indirect sighting devices.
> b) At the same time the *Sturmartillerie* has to totally fulfil the tasks of the *Panzerjäger*, which is currently under development. Thus double development work will be avoided.

In a detailed comment, dated 10 August 1936, 2.GenStbH summarized the development of tank (particularly the infantry tank) production in other countries. In this statement the introduction of infantry tanks is declined. At the same time it gives a good indication of the latest German tank technology:

> 1.) Based on experience gained in World War I, the world-wide development of the tank is aimed at increased speed and cruising range. Higher speed and manoeuvrability allows the tank greater protection against modern anti-tank weapons; more than an increase in armour protection which has many disadvantages (decrease in speed, limited bridging ability, also difficulties with transport during operational transfers). Parallel to this the tank has generally lost the ability to move up in close contact with the infantry. Tanks are now combined within specialized mechanized formations, which are suited for



One of the sPaK prototypes built on the chassis of a PzKpfw III Ausf B: note the distinctive eight-wheel running gear. The men of the *Sturmartillerie* are dressed in the distinctive black *Panzertruppe*-style uniforms. (Anderson)

operational use – assuming a corresponding structure – deployed on a massive scale, in direct support of the infantry.

2.) For our tank force we aim for 66 per cent to be armed with a 3.7cm main gun. With regard to armour protection, the 3.7cm-armed tank is not suitable for supporting the infantry during longer operations. However, if used in combat appropriately, it can provide the infantry with direct-fire support. Contrary to the slow-moving infantry tank, it has to be deployed in wave-like formations. These have to be launched successively to provide steady support to the infantry attacking the enemy's zone of resistance… By taking full advantage of the speed of our tanks it is possible to avoid them falling victim to the numerous enemy anti-tank weapons.

3.) Since it is easier to increase the firepower of an anti-tank gun than to thicken the armour on a tank, even the most heavily-armoured infantry tank will more likely run into danger and be destroyed than the lighter faster-moving 3.7cm tank. Furthermore, a specialized infantry tank could become "too specialized" to use it for operational combat.

4.) For the above mentioned reasons, 2nd Department considers that the introduction of an infantry tank for the direct support of the infantry is neither desirable nor necessary.

By this time the development of the *Sturmgeschütz* was already decided.

The birth of the *Sturmartillerie*

1

In 1935, the concept of this new branch of the military had been accepted. The *Generalstab des Heeres* (GenStbH – general staff of the army) had finally approved the establishment armoured *Begleitbatterien* (escort batteries) to support the advancing infantry, but despite it being the subject of much controversial debate, the *Sturmartillerie* was born. However, at that time no serious consideration was given as to the structure and equipment for this new branch of the army. Indeed, the contract to develop and build the *Sturmgeschütz* was not issued until 5 June 1936.

A document dated 16 June 1936 stated:

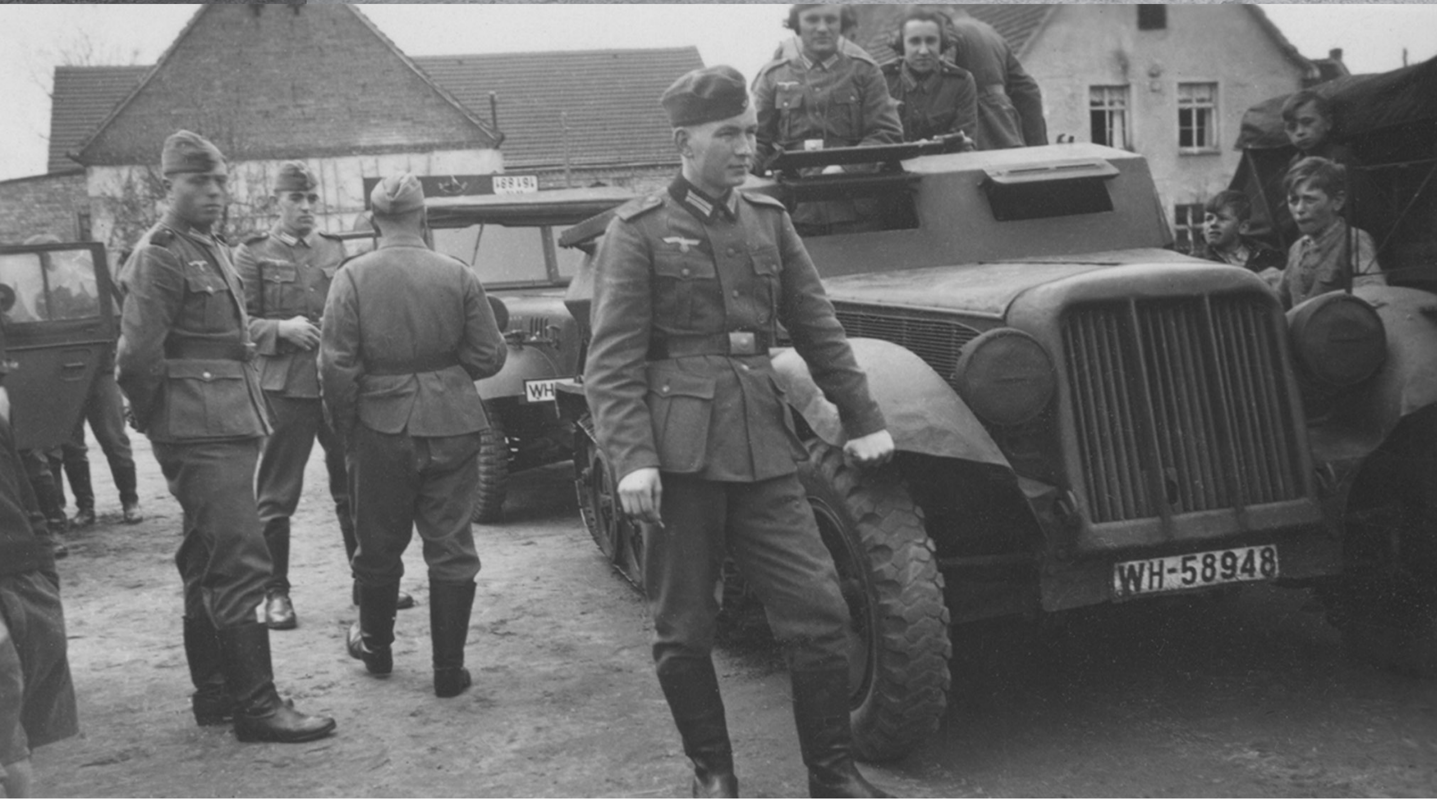
> The *Sturmartillerie*, no matter whether it will use conventional tanks or armoured motorized guns [SP guns], is a part of a standard infantry division. Its commitment during an assault complies with that of the light escort batteries of the last war.

It is not surprising that the artillery claimed the responsibility for this new branch of service. This was a logical step, since the light escort artillery expanded the field of action of the conventional artillery, also the necessary command chain to the infantry was already in existence and well proven.

On the other hand there was a certain resistance among the fledgling *Panzertruppe*. The tank force had moved on since the first exercises, using small tanks, had been held in 1935 and 1936. In a process of self-propagation, and spurred by rapid technical progress, the *Panzerwaffe* had undergone a revolutionary change from being tactically and technically a World War I-vintage support weapon for the infantry, to a force able to operate independently. The organizational structure of a *Panzerdivision*, still contained errors, but would prove to be ideal for the rapid tactical advances made over the coming years of the war.

Faced with using limited funds, the *General der Panzertruppe* opposed the plan but was not successful; his department being unable to provide any suitable alternative to meet the requirements of the growing infantry.

An SdKfz 252 armoured ammunition carrier of *Sturmgeschütz-Abteilung* 244, in a village somewhere on the *Ost* (east) front. The vehicle was designed to keep *Sturmgeschütz* crews supplied with ammunition under battlefield conditions. (Getty)



The SdKfz 253 *leichte gepanzerter Beobachtungskraftwagen* (le gep BeobKw – light halftrack observation vehicle) was another important part of the *Sturmartillerie*, and was used by the commander of a *Sturmgeschütz* platoon. The vehicle is one of the original prototypes built on the un-modified chassis of an SdKfz 10, a 1-ton *leichte ZugKraftwagen* (light tractor vehicle). (Hoppe)

Initial Requirements

The very strictly defined tasks for the *schwere Panzerabwehrkanone* (sPaK – heavy anti-tank gun) demanded an equally exacting design specification for the *Sturmgeschutze*. The height of the vehicle was not to exceed that of a standing man, which meant that a conventional tank was unsuitable as this could only be achieved by removing the turret. Subsequently, it was decided to mount the main gun directly in the hull, which resulted in a limited side traverse. Since there would be no turret, which reduced weight, it was possible to fit the vehicle with the armour required for protection against frontal fire from 20mm automatic weapons and lateral fire from heavy infantry weapons. The gun was traversable to some 30° on each side, and could be elevated to attain ranges of up to 7km. However, both requirements were never fully achieved.

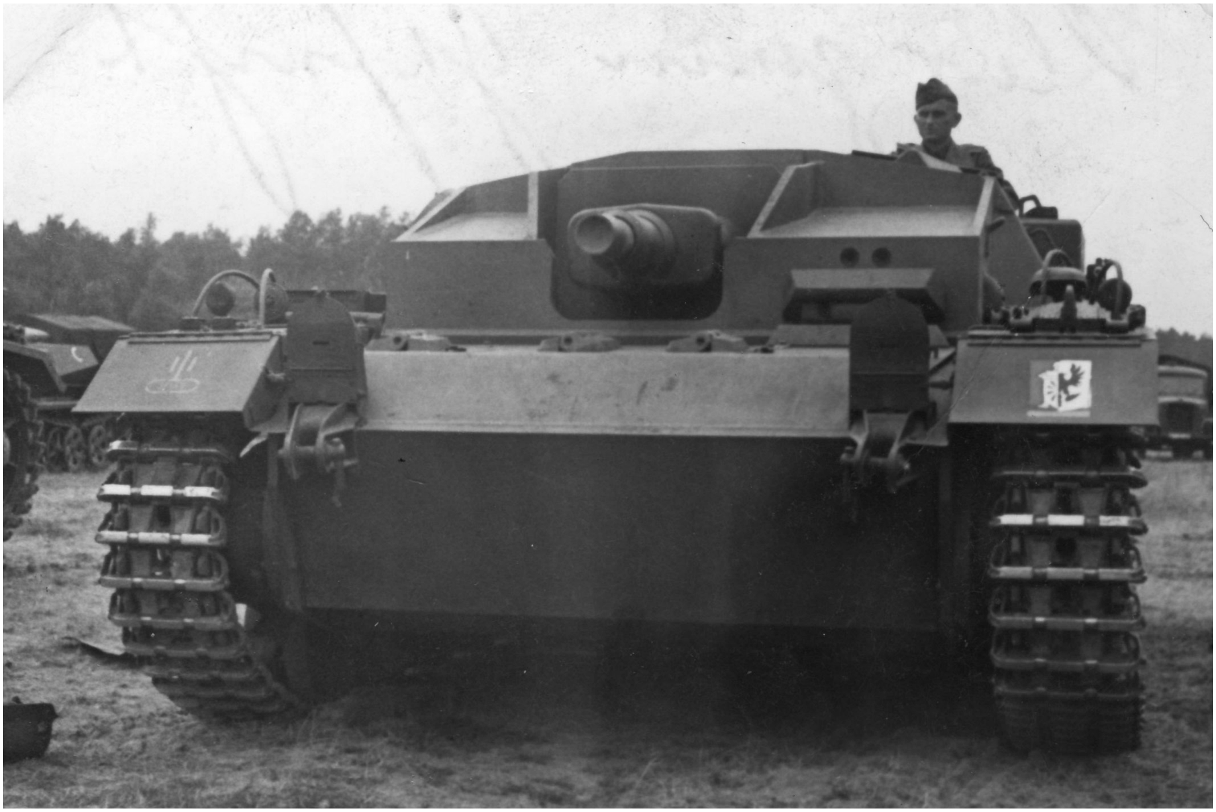
The sPaK was to be capable of defeating soft targets and field fortifications, such as dug-in machine guns and mortar positions, by direct fire. For this, high-explosive (HE) ammunition, which had good explosive impact and fragmentation, were demanded. Smoke shells to 'blind' the enemy were also specified.

Before outbreak of war, the assigned targets for the sPaK were as detailed above. However, it was now explicitly requested that the type be capable of destroying any enemy tank which appeared on the battlefield. For this the gun was to be capable of firing anti-tank ammunition able to penetrate all known armour at ranges up to 500m.

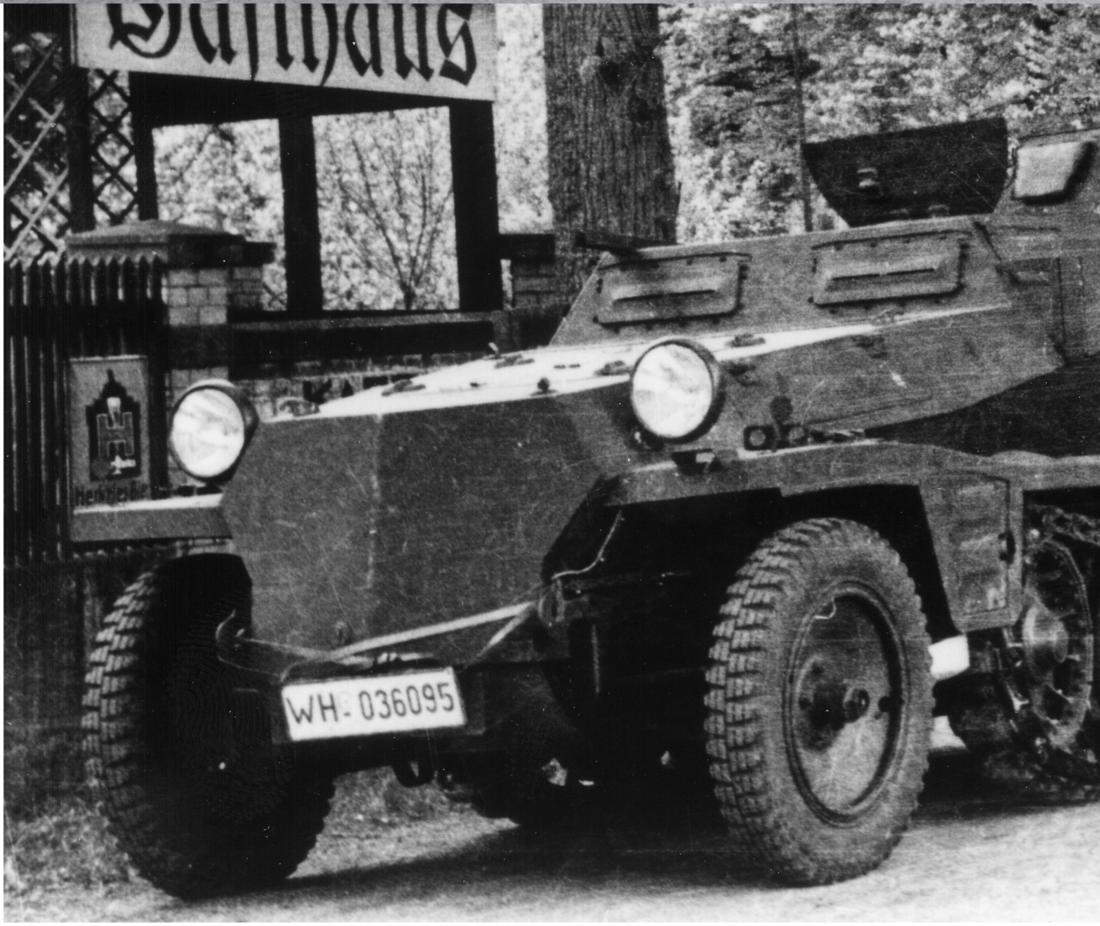
In 1935, the *fremde Heere* West (army intelligence West) believed that it had gathered enough information about the tank force of Germany's most likely adversary: France. At that time, the Renault R35 light infantry tank was known to be well armoured, but was slow and lacked firepower. However, the German military was completely unaware of the well-armoured and highly-manoeuvrable Somua S35 medium cavalry tank. Also the French had substantial numbers of the Char B1(bis), heavy 'break-through' tank available, but *fremde Heere* West did not consider the type as a serious threat. This was an almost fatal mistake (indeed shortly before the outbreak of war, steps were taken to introduce guns and ammunition capable of defeating the Char B1 [bis] heavy tank).

In June 1936, Daimler-Benz was contracted to develop a new weapons system. Although the designation *Sturmgeschütz* (assault gun) was already being used in a number of documents, the term sPaK, sometimes with the suffix Sfl (*Selbstfahrlafette*), was the most commonly used. Another designation was *Panzer-Selbstfahrlafette* III (PzSfl III – armoured tracked self-propelled [SP] gun III). This latter designation appeared for a short time after the *Zugführerwagen* (ZW – platoon commander's vehicle) hull was chosen as the chassis for the sPaK.

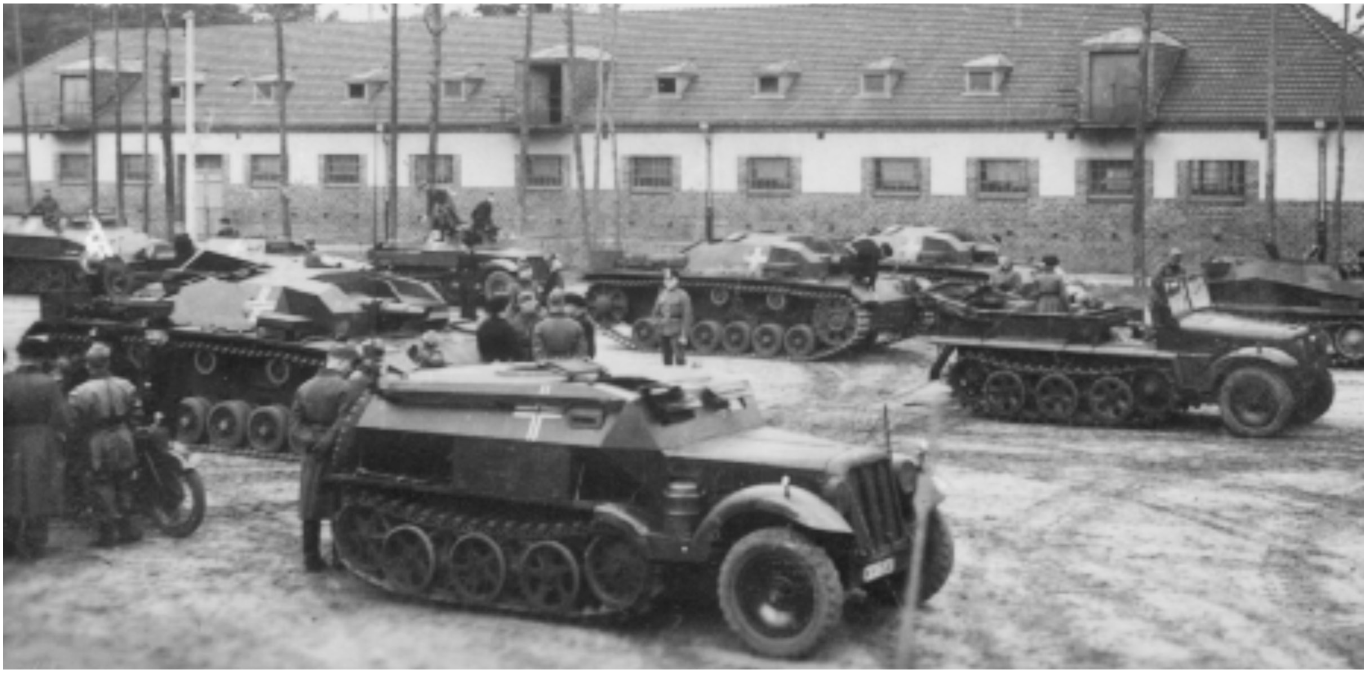
Daimler-Benz was sole manufacturer of the ZW, the tank which was intended to become the main battle tank for the *Panzerwaffe*. Production of the ZW (later designated *Panzerkampfwagen* [PzKpfw] III) began in 1937 on a small scale, but numbers were soon increased. The first pre-series



This *Sturmgeschütz* Ausf C or D of StuGAbt 189 *Ritter-Adler Abteilung* (Knight-Eagle Battalion) is fitted with headlamps protected by temporary guards. It was quite common for *Sturmgeschütz-Abteilungen* to modify their vehicles to suit conditions in combat. (Anderson)



Below: A collection of vehicles from *Artillerie-Lehr-Regiment* (ALR) in 1939 includes one of the SdKfz 253 prototypes. In the left background is an SdKfz 251, (un-armoured halftrack) which was produced to transport replacement crews for StuGs on the battlefront. (Anderson)



Left: Two early production SdKfz 253s le gep BeobKw (*Führerwagen*), during a break in road-running trials through the Harz Mountains. As with the SdKfz 252, the production version used a shortened SdKfz 10 chassis as a weight-saving measure. (Historyfacts)

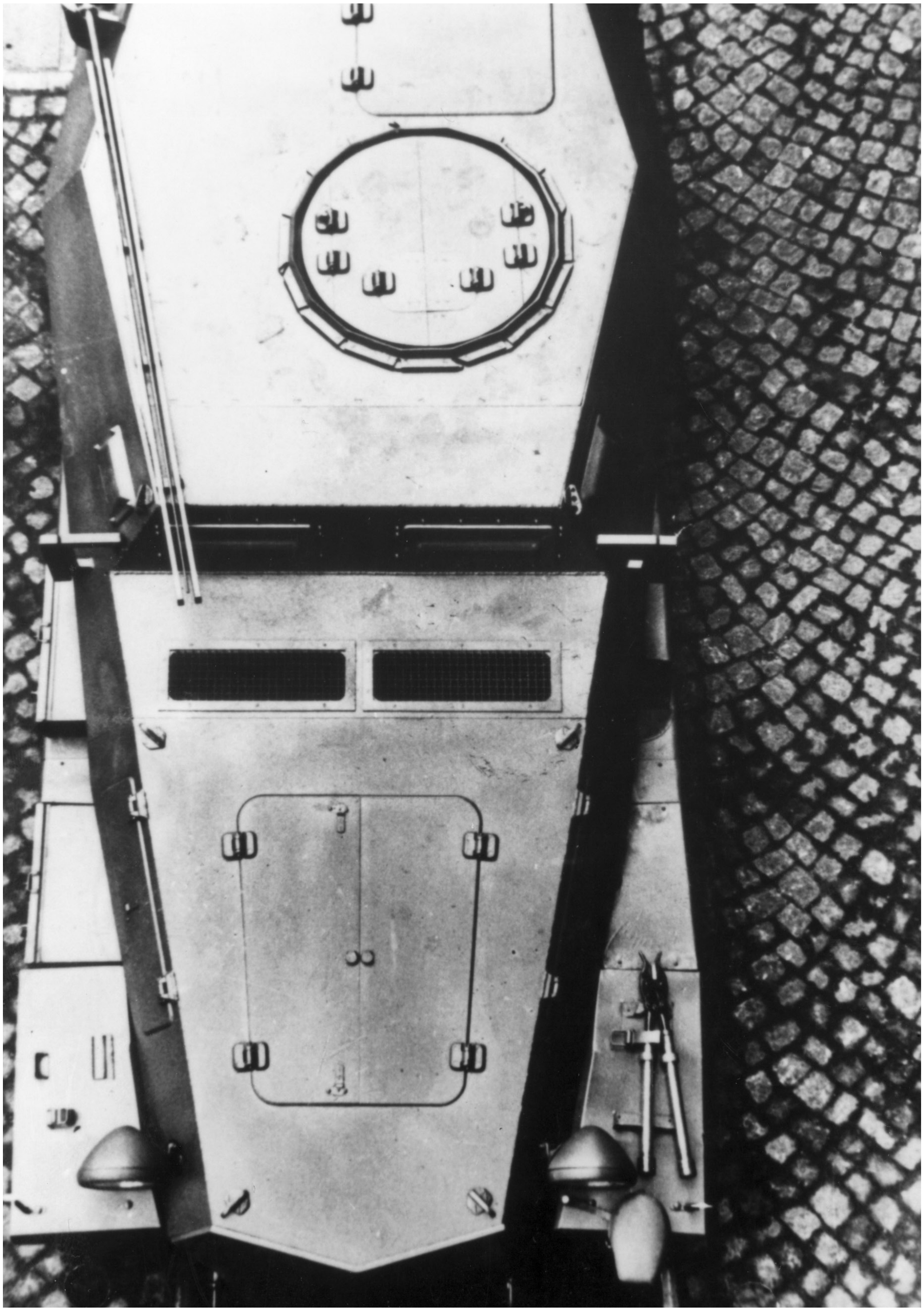
vehicles were intended for the testing of alternative mechanical layouts, the Ausf A to D were fitted with different suspension systems. The first *leichte Panzerkompanien* (light tank companies) were established using a number of ZW vehicles from these different production batches. Approximately 100 vehicles were built and many were used in the early battles of World War II.

As the development of the sPaK progressed, Daimler-Benz selected five ZW chassis from the second series 2./ZW (later designated PzKpfw III Ausf B) to develop a fully closed superstructure to house the gun and its crew.

The suspension on the 2./ZW had eight small running wheels sprung by externally mounted leaf springs, quite familiar at that time. The engine was mounted in the rear, the final drive with gearbox and steering mechanism were positioned in the front of the hull.

By 1937, another important armaments project, the *Begleitwagen* (BW – support vehicle) or PzKpfw IV, was already in production. This tank was designed to assist an attack by a medium tank company: a tactical use not dissimilar to that of the later *Sturmgeschütz*. The BW was to be armed with a low-velocity 7.5cm gun, which also fulfilled the requirements of the sPaK project, but it was halted. Subsequently, it was decided to choose the 7.5cm *Kanone* L/24 for the *Sturmgeschütz*. The gun was positioned on a small pedestal-type mounting in the centre of a 2./ZW hull.

Five *Versuchsstücke* (test vehicles) were built between 1937 and 1938. These were purely trial vehicles on which the superstructure (casemate) was fabricated from mild steel, and were not intended for front-line service. All five vehicles were used for extensive mechanical reliability, firing and combat trials. Later, all were used as training vehicles.



The SdKfz 253 le gep BeobKw had a large rotating hatch fitted into the roof, to allow the commander to use a *Scherenfernrohr* (scissors periscope) from inside the vehicle. (Historyfacts)

Sturmgeschütz Layout

Ausf A

By March 1940, Daimler had developed the first combat ready O-series which was fitted with an armoured superstructure, and the new designation of *Sturmgeschütz* was officially introduced. The O-series received the suffix Ausf A.

For the production series, the chassis of the latest ZW version the 5./ZW or PzKpfw III Ausf E was chosen, which had six road wheels mounted on torsion-bar suspension. The ZW hull could be used almost unchanged, but the frontal plating was increased to 50mm armour.

The gun was positioned on a pedestal-type mounting behind the gearbox. For protection the gun and the crew of four (commander, gunner, loader, and driver) were protected by a shallow multi-angled casemate. Forty-four rounds of ammunition were stowed inside the vehicle.

An UHF (ultra-high frequency) *Empfänger* h, radio receiver was installed a small bay on the left-hand side of the superstructure.

Engine and Transmission

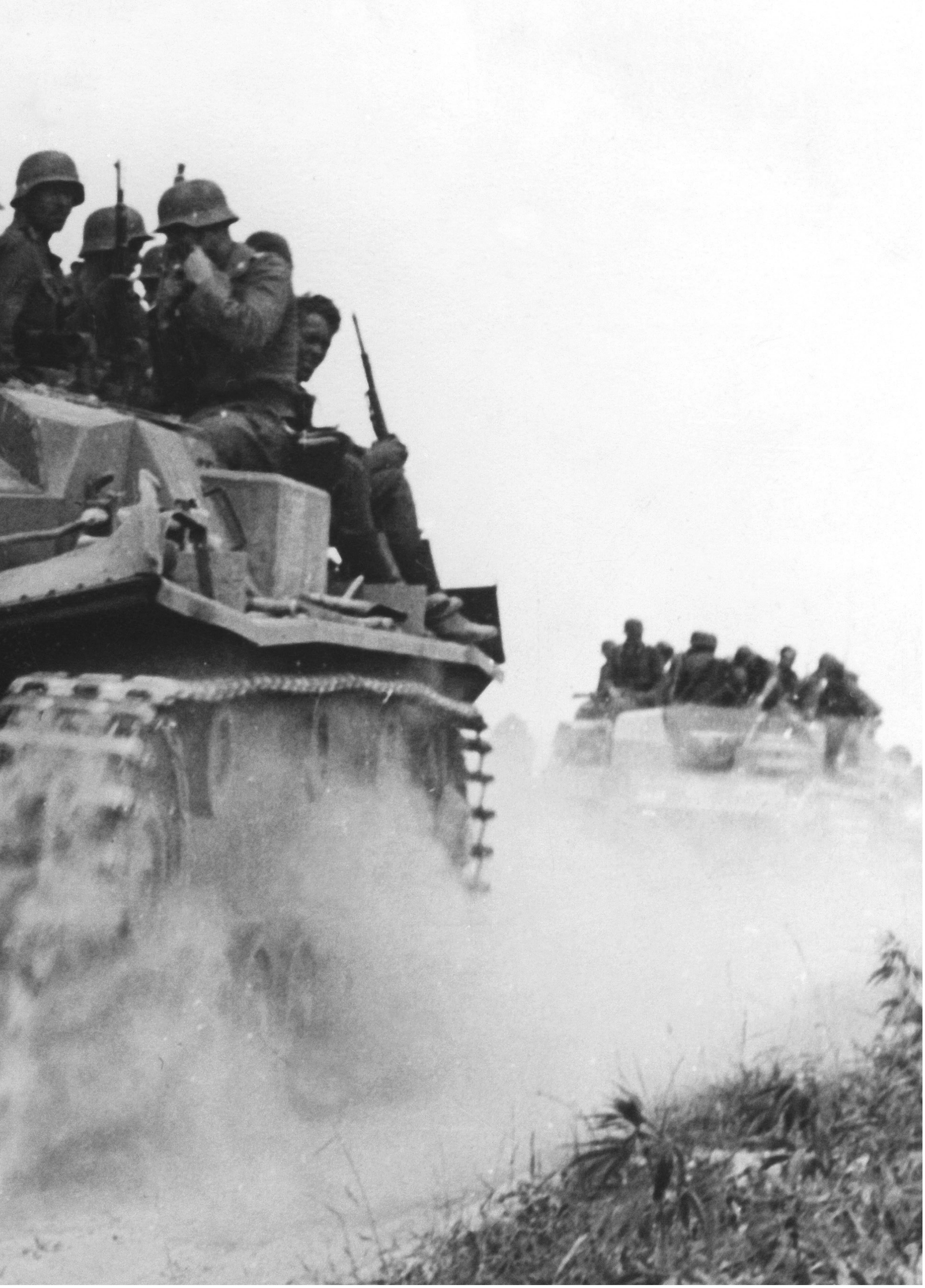
The Maybach HL 120 TR, as fitted in the 5./ZW, had a maximum power output of 300hp, and was coupled to a Maybach Variorex ten-speed, pre-selector gearbox. The *Sturmgeschütz* Ausf A could achieve a top speed of 67kph, but early combat experience identified severe problems with the suspension, especially the rubber-rimmed road wheels which wore out rapidly when running at that speed. This detail is taken from an *Artillerie Lehr-Regiment* (ALR – artillery instructional regiment) instructional document:

Engine	Maybach HL 120 TR
Performance at 3,000rpm	300hp
Cylinders	12 (V configuration)
Oil reservoir	25ltr (approx.)
Fuel reservoir	310ltr
Weight	20t
Power to weight ratio at max performance	15hp/t
Range on road	160km

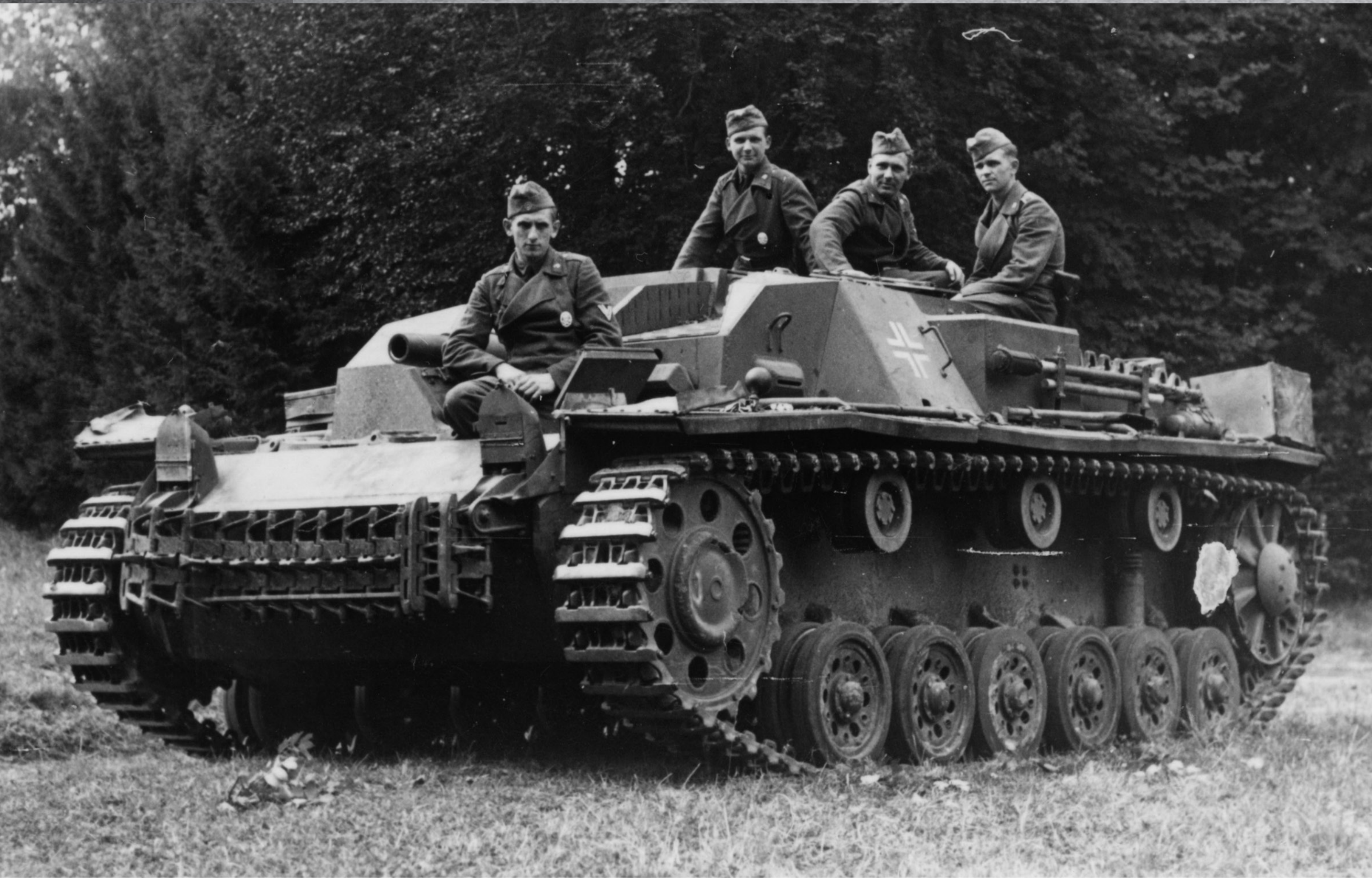
Armament

The *Sturmgeschütz* was armed with the 7.5cm K (*Kanone*) and two *Maschinenpistole* (MP) 38. The gun was basically identical to the 7.5cm *Kampfwagenkanone* (KwK) mounted in the BW tank (PzKpfw IV). The principle difference between the two weapons is in the mounting and the gun-sighting optics: the tank gun was fitted with a telescopic sight, and the *Sturmgeschütz* had an artillery-type panoramic sight which allowed the gun to be used for indirect fire – one of the basic requirements.

From a document published by the *Artillerie Lehr-Regiment*, Jüteborg, on 13 January 1941:



Infantrymen take the opportunity to travel on these *Sturmgeschütz* advancing on a dusty road toward Moscow. The gun muzzle is protected by a dust cover. (Getty)



A *Sturmgeschütz* Ausf A from *Sturmbatterie* 660: Note the vehicle has 38cm-wide tracks, and a combination of narrow and wide (designed for the later 40cm-wide track) road wheels. (Anderson)

Type description 7.5cm PaK (Sfl)

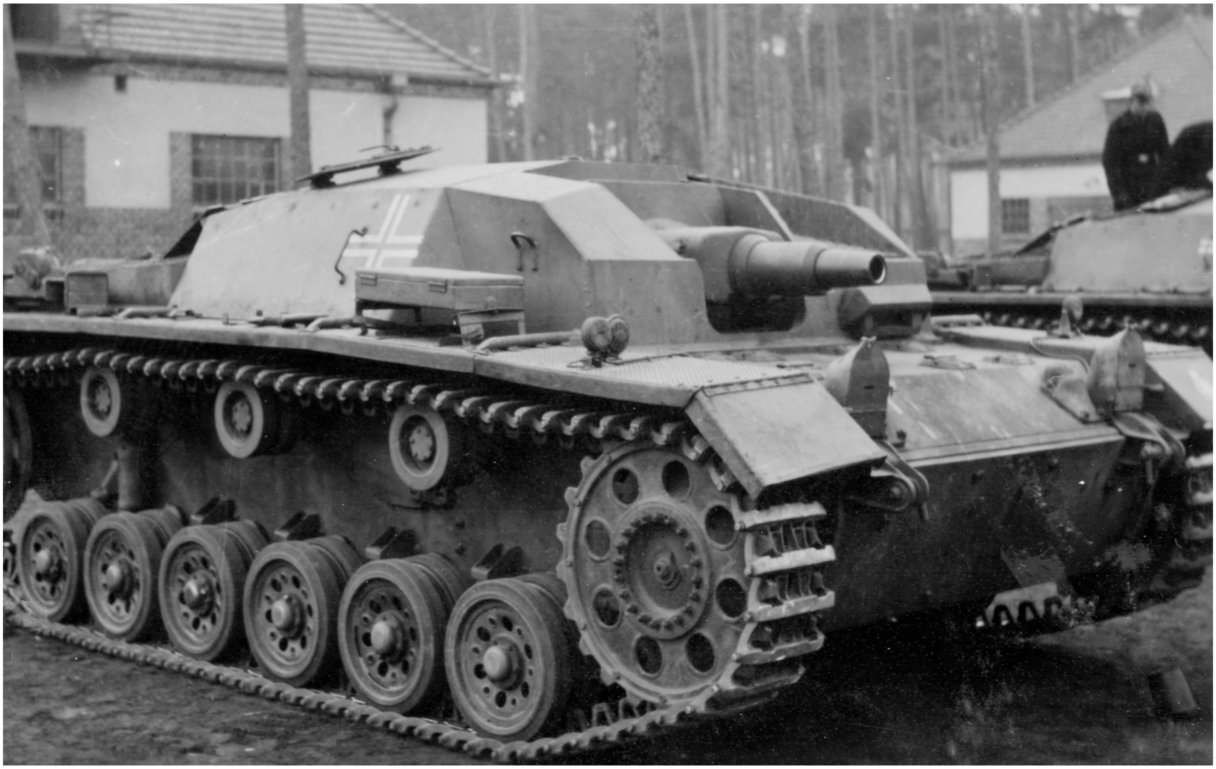
1.) General: The 7.5cm PaK, is a semi-automatic weapon, with drop-block type breechblock and electrical firing, which is mounted on a low pedestal in the centre of the chassis [*Panzerwagen* III]. The top carriage can be traversed 12° to each side.
Gun barrel, recoil brake and recuperator are mounted in the cradle, which is bolted to the mounting behind the cradle armour. The cradle mounting is carried on a trunnion bearing fitted to the roof of the compartment. The weight of the gun is balanced by a spring-loaded compensator. The elevation mechanism allows an elevation of between minus 10° and plus 20°. The gunner operates the sighting mechanism, traverse and elevation gear. His seat is positioned to the left side of the carriage.

2.) Barrel: calibre 7.5cm, barrel length 1,568mm, rifling 1,308mm, breech chamber 260mm, muzzle velocity 425mps, maximum range 6,000m.

[Author's note: The usage PaK and *Panzerwagen* III remains mysterious. The choice of words and several other technical designations prove that this document was written by the ALR staff rather than by any official body]

A further information leaflet drawn up by the ALR, Jüterbog, dated 19 September 1939, said:

> Instructions for the ammunition of the 7.5cm *Kampfwagenkanone* and the *Sturmgeschütz* 7.5cm K:
>
> All ammunition mentioned in the leaflet can be fired by the 7.5cm KwK and the *Sturmgeschütz* 7.5cm K. The ammunition will be named only referring to the 7.5cm KwK.
> The 7.5cm KwK fires the following ammunition:
>
> Armour-piercing
> 7.5cm Gr Patr KwK
> 7.5cm PzGr Patr KwK
> 7.5cm NbGr Patr KwK
> 7.5cm Gr Patr KwK
>
> Fired without delay fuse:
> The 7.5cm Gr Patr KwK is a conventional HE shell with the standard impact fuse kl AZ 23. The fuse has an adjustable delay of 0.2sec. The shell is used to combat troops in the open or with light cover or in trenches. Larger fragments will penetrate light armour shields and steel helmets.

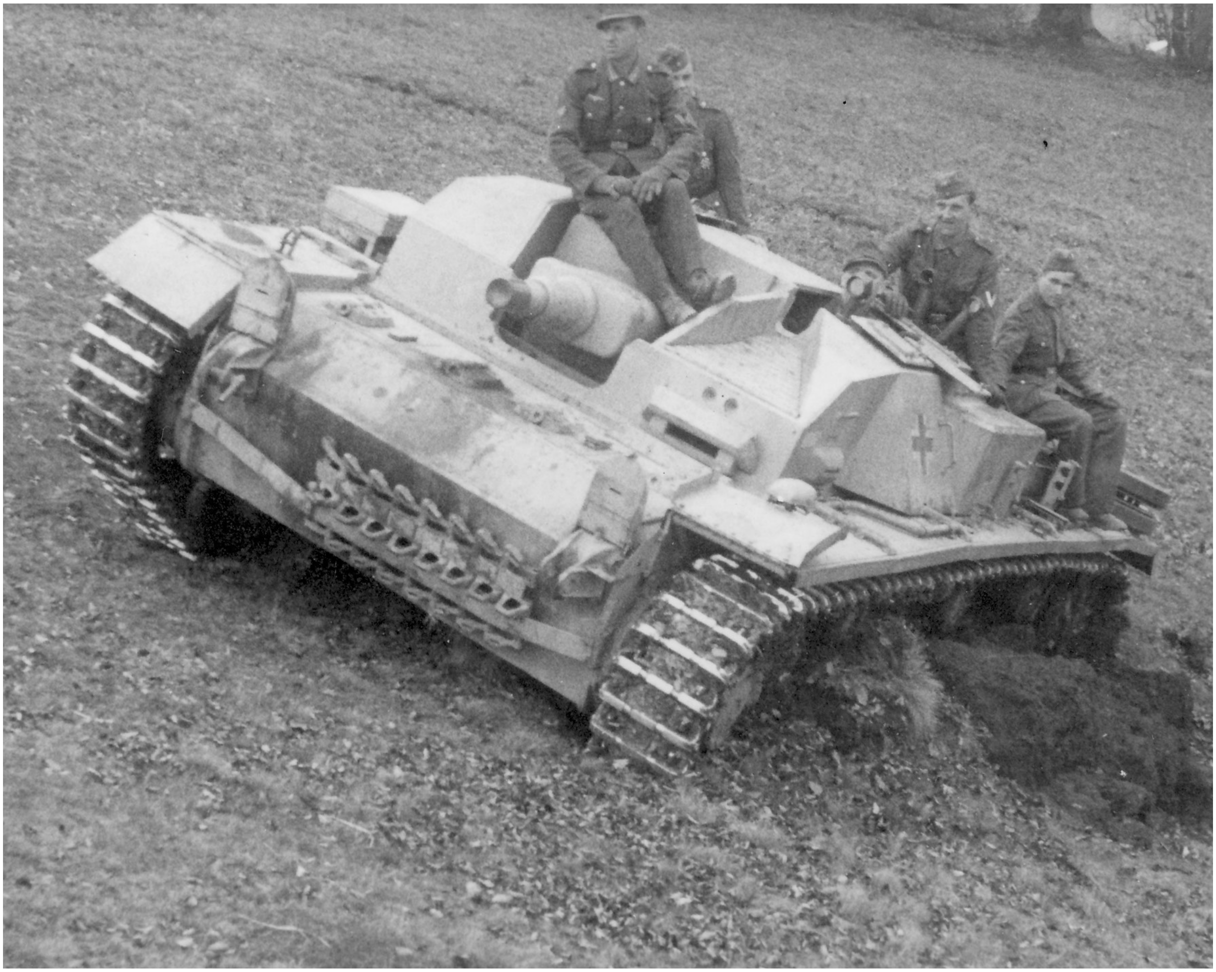


A *Sturmgeschütz* Ausf A parked in the technical sector of the Jüterbog garrison. This vehicle is one of a small number to be built on a PzKpfw III Ausf E chassis diverted from the production line: Note the bolted-on front armour and the escape hatch in the side of the hull. Most *Sturmgeschütz* from this batch were used only for training purposes by the *Artillerie-Lehr-Regiment*. (Zimmermann)

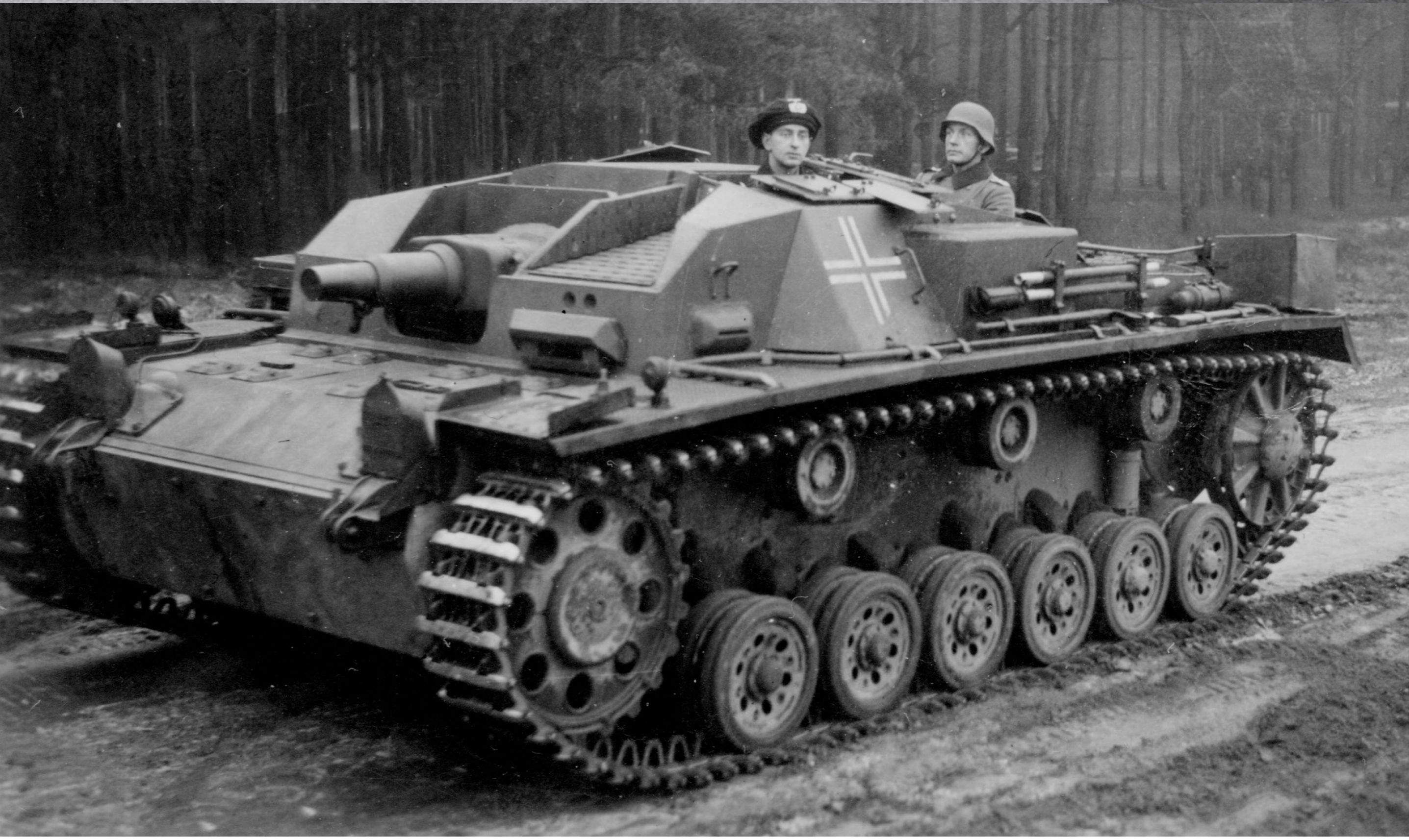
Fired with delay:
On level ground at low angles of deflection, ricochets are a certainty. These are suited to combat against moving targets in the open or when hidden in trenches or behind houses. If the deflection is great enough to avoid a ricochet, the shell will have the impact effect of a mine, destroying targets under cover, in shelters and in houses.

7.5cm PzGr Patr KwK
This ammunition is to be used to combat tanks. The trajectory of the shell is indicated by a tracer flare with 2sec burn time.
Base detonating fuze with tracer.

7.5cm NbGr Patr
This ammunition is used for smoke-screen cover. The required number of shells is subject to the wind and weather… The smoke cloud has a diameter of 15 to 20m. It will remain in place for up to 30sec unless blown away on the wind.



A *Sturmgeschütz* Ausf B, which has been fitted with a *Selbstfahrlafette-Zielfernrohr* (Sfl Zf) 1 periscope sight. However, in combat the rectangular hatches would have to be opened, as there was no cutout for the new optic in the roof plate. The light colour of the vehicle suggests that it is painted *Dunkel Gelb* (dark yellow), indicating that it was a training vehicle used by an AusbAbt after 1943. (Prigent)



A *Sturmgeschütz* Ausf A (on PzKpfw III chassis) of the ALR Jüterbog: Note the 20mm thick bolted-on front armour and the PzKpfw III-type brake ventilator hoods. The gunner is wearing the distinctive black uniform and beret of a 'tanker'; a *Mannschaften* (enlisted) soldier is standing in the commander's hatch. (Historyfacts)

The 7.5cm PzGr Patr KwK

According to British nomenclature, the 7.5cm PzGr Patr, also referred to as 7.5cm K Gr rot (*Kopfgranate, rot* – solid shot, red) was an APCBC (armour-piercing capped, ballistic cap) shell. The shell combined an armour-piercing core with a cap of softer material, which prevented the shot from shattering upon the impact. A further ballistic cap improved the aerodynamics of the shell.

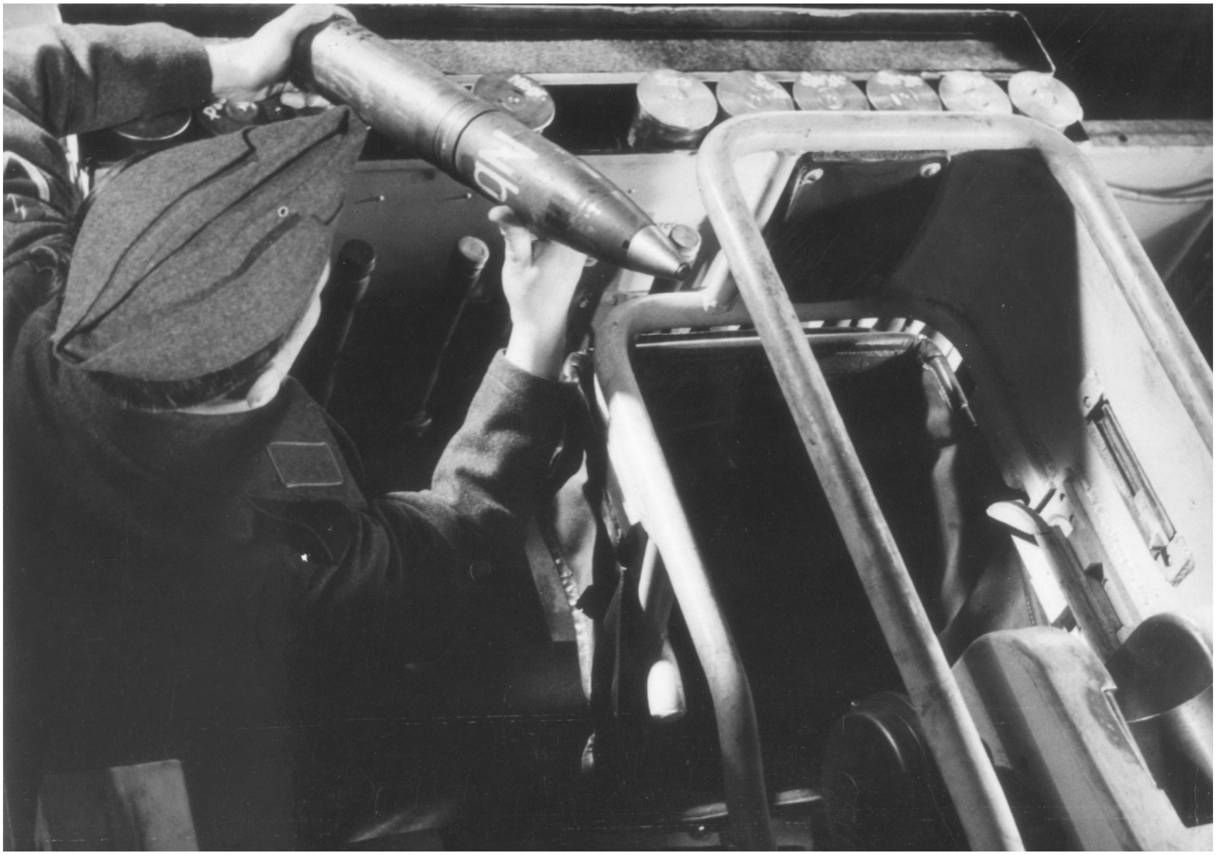
The 7.5cm PzGr Patr weighed 6.8kg and reached a muzzle velocity of 385mps. The armour penetration data was as follows:

7.5cm K	Range	100m	500m	1,000m
Kopfgranate rot	Penetration	41mm	38mm	34mm

Vision Devices (Optics)

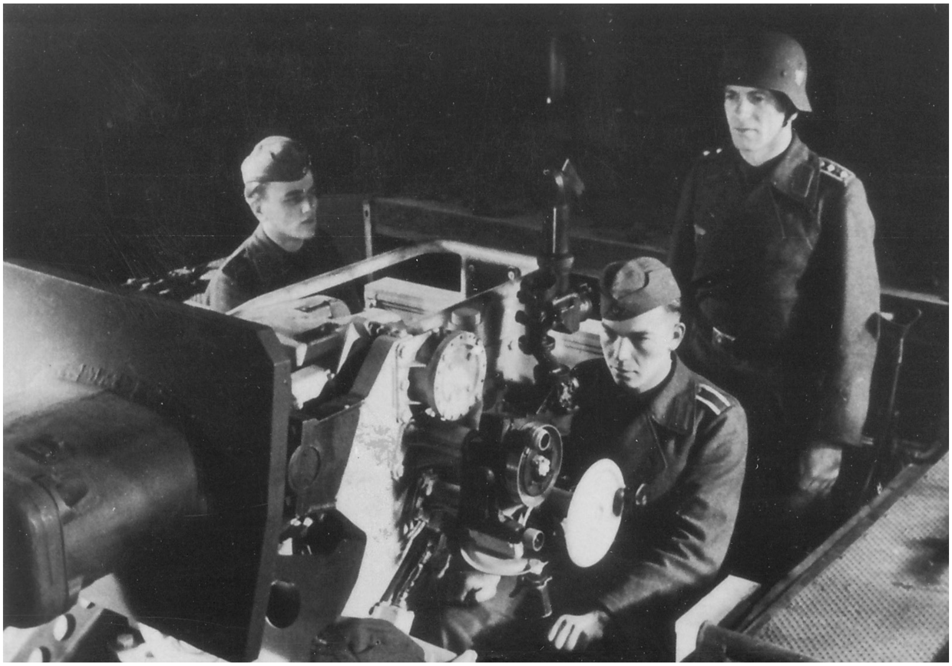
The commander had a *Scherenfernrohr* (scissors periscope), mounted in front of his position, with which he monitored the battlefield. He assigned selected targets to the gunner. However, for a clearer overview the commander would have to look out of his hatch: very dangerous even when wearing a steel helmet.

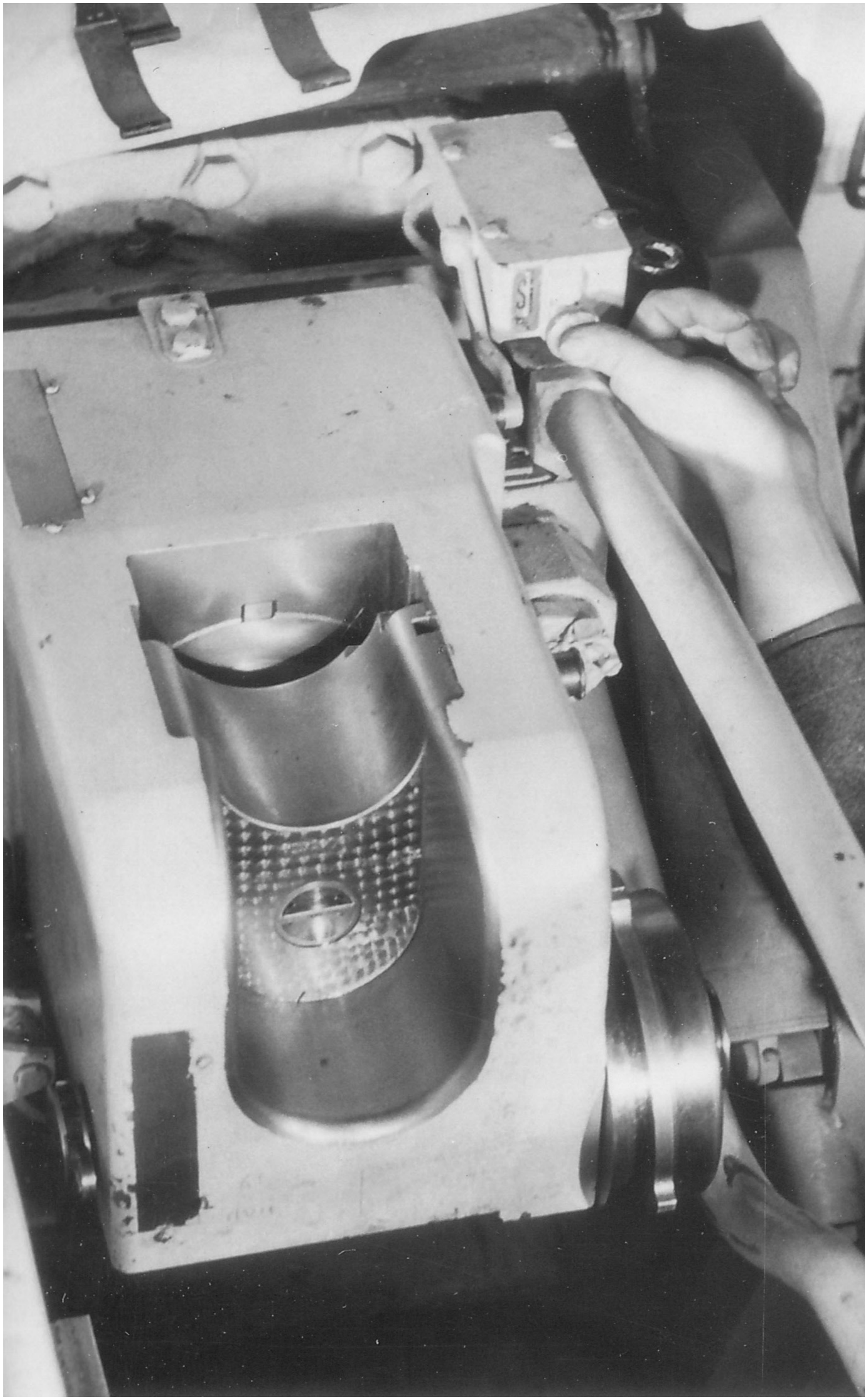
A *Rundblickfernrohr* (RblF) 32 panoramic gunsight, was mounted directly in front of the gunner´s seat. It fitted in a small aperture through the front



Above: The loader in a *Sturmgeschütz* prepares to insert a 7.5cm smoke shell into the breech. To the rear is a rack for 12 rounds of ammunition, the majority of which was stored in front of the loader's position. (NARA)

Right: The crew of a *Sturmgeschütz* Ausf E in their positions: Note the position of the *Selbstfahrlafette-Zielfernrohr* (Sfl ZF 1a) for the gunner. (NARA)

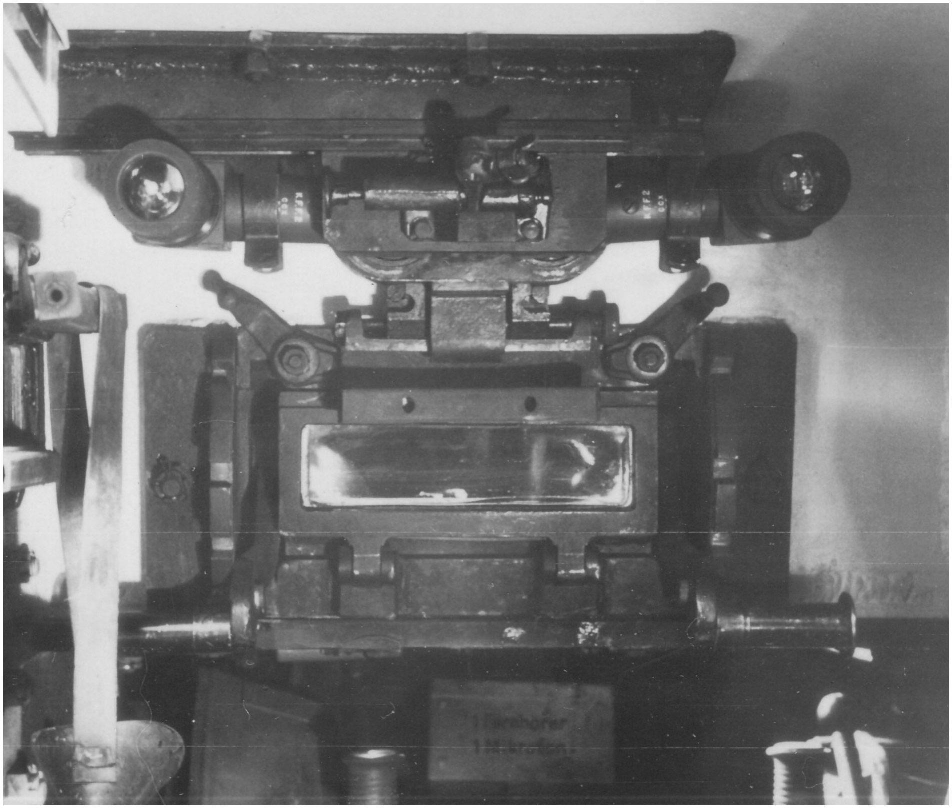


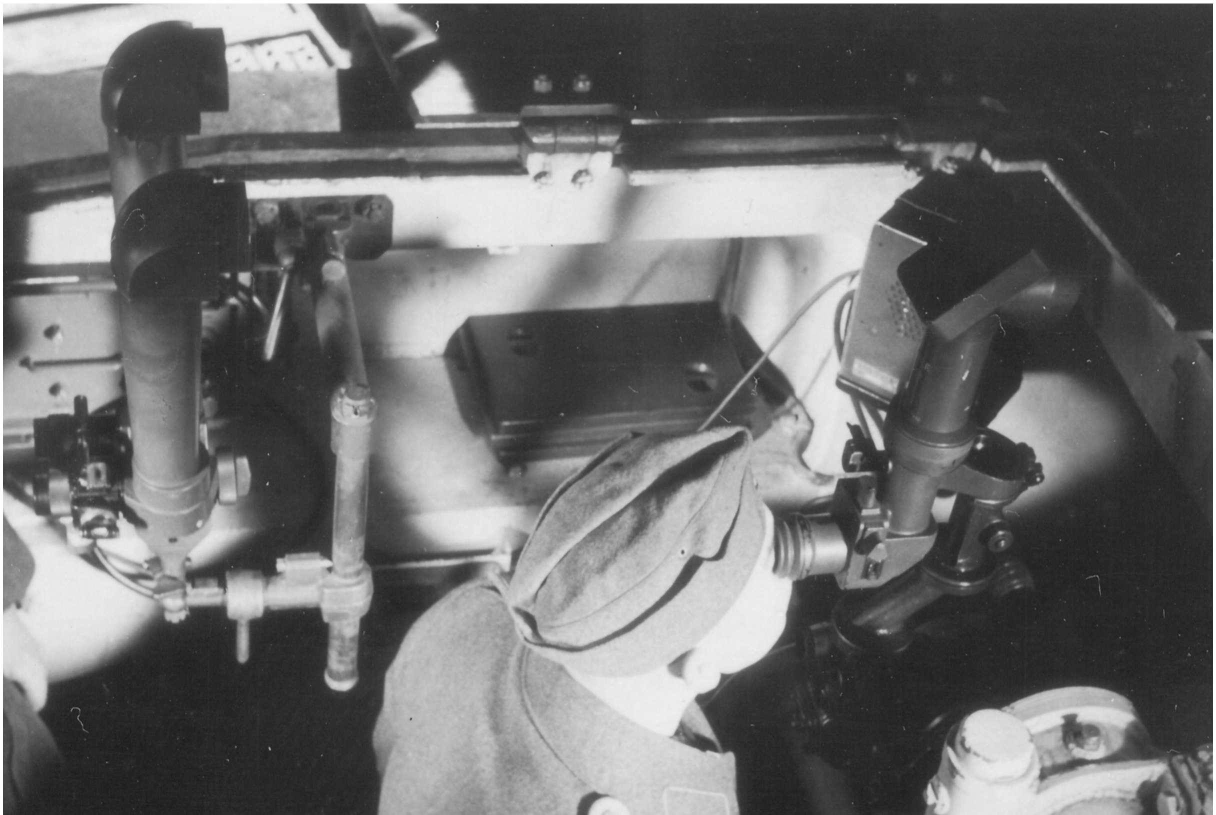


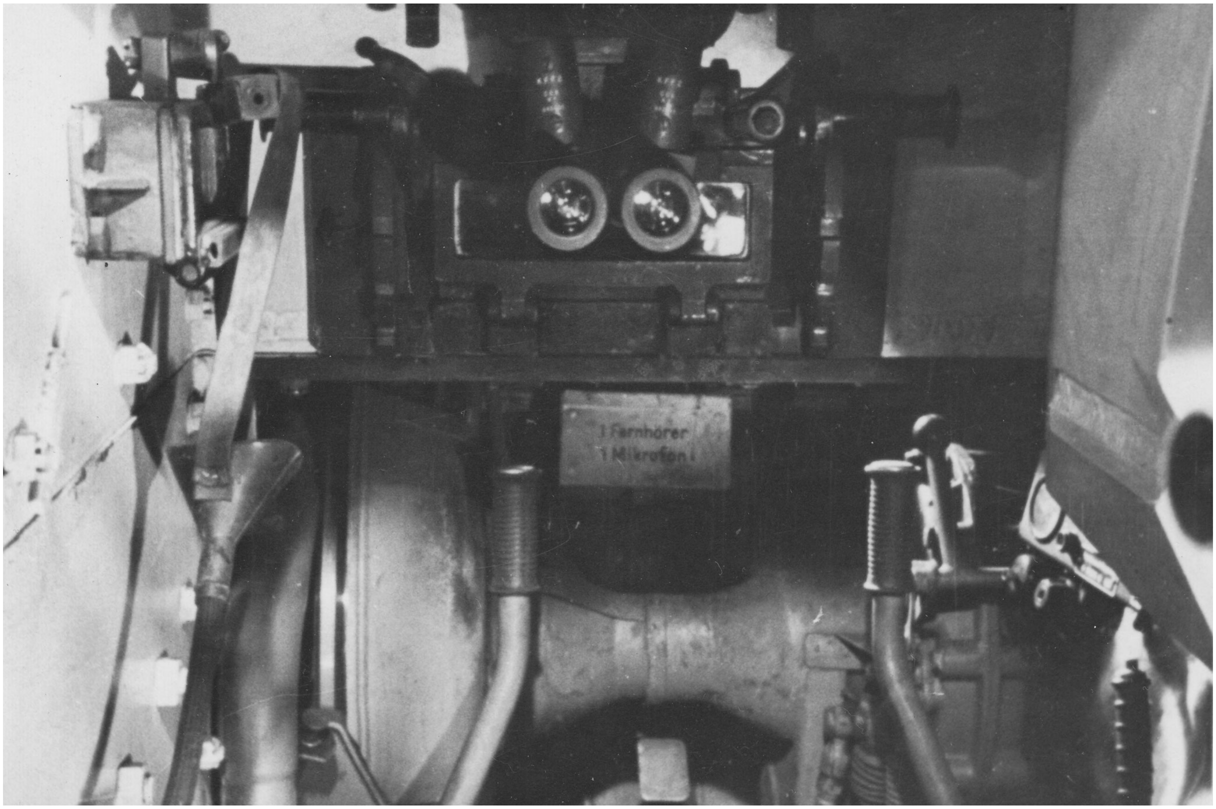
The 7.5cm *Kanone* breech block: The locking button is marked 'S' (*Sicher* – secure or safe), and 'F' (*Feuer* – fire). The trigger to fire the gun is mounted on the side of the traversing hand wheel. (NARA)

Right: The driver's *Fahrersehklappe* 50 (visor to fit in 50mm armour plate). In combat the synthetic glass vision block was protected by an external armoured cover. The dual telescopes could be folded down to allow the driver improved vision of the battlefield. (NARA)

Below: The Sfl ZF 1 periscope sight for the gunner was fitted on the left-hand side of the gun mounting. At left is the *Scherenfernrohr*, scissors-type periscope, for the commander. (NARA)







The driver's position: Note the external visor is closed and the dual telescopes are folded down. The glass block of the left-hand side fixed visor is visible. This *Sturmgeschütz* Ausf E was not fitted with intercom so the crew communicated by *Sprachrohr* (speaking tube). (NARA)

plate of the casemate and allowed a direct view of the target. However, it was positioned directly under the roof, which resulted in the gunner having a limited line of sight.

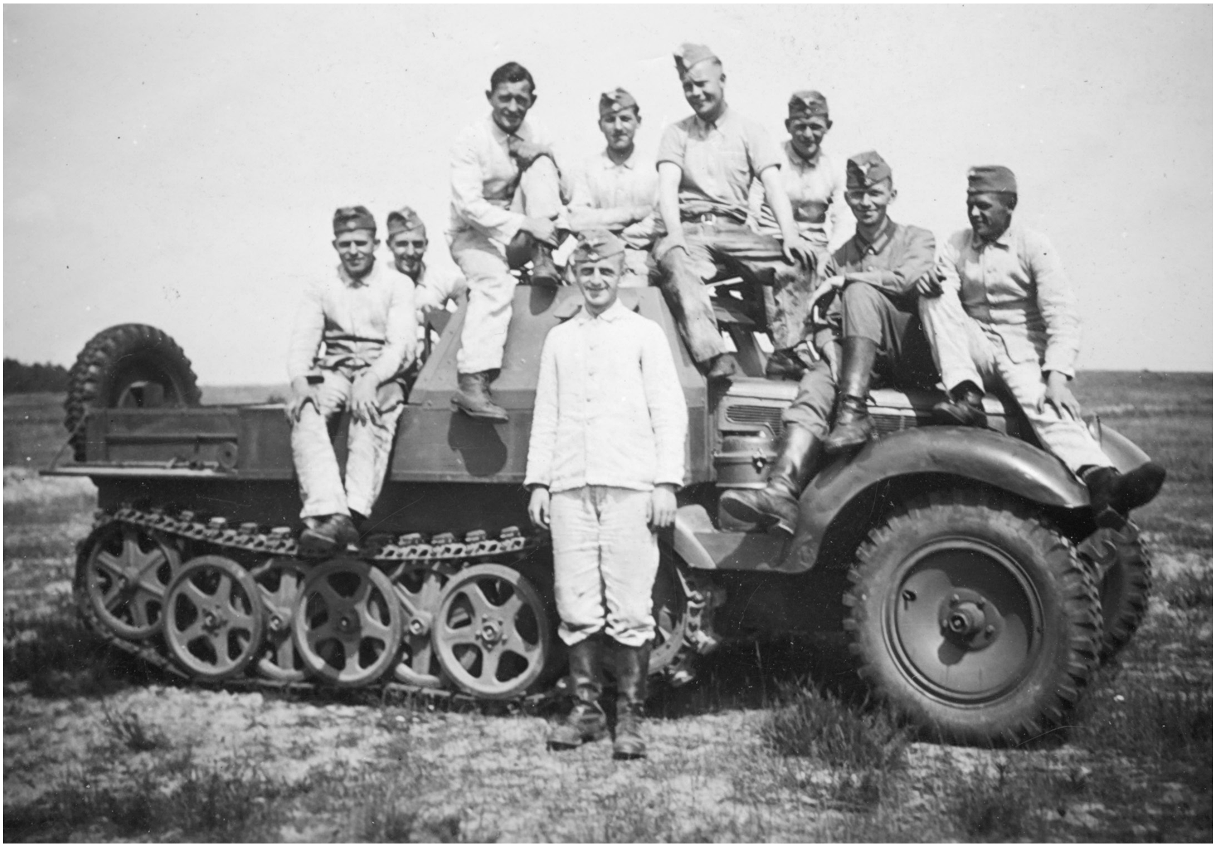
The driver had a *Fahrersehklappe* 50 two-position visor. Under normal conditions he would see through a bullet-proof glass block with a wide angle of view. Under fire, an armour shield was folded down to cover the block. The driver now relied on the dual telescopes with two vision holes in the 50mm frontal armour. A smaller visor was mounted on the left-hand side of his position.

Changes During Production

The next production version was the Ausf B, which was externally practically unchanged. Major differences was the chassis, which was now from the current production PzKpfw III Ausf G tank. This version was fitted with a conventional and much more reliable transmission, wider tracks and running wheels.

Ausf C and D

The Ausf C and D were equipped with an improved panoramic gunsight, the *Selbstfahrlafette-Zielfernrohr* 1 (Sfl-ZF 1a) which was fitted with an extended body to allow it to protrude through the roof plate. This improved the range



At the same as the SdKfz 253 le gep BeobKw was being developed, a prototype for the *leichte gepanzerter Munitions Kraftwagen* (le gep MunKw – light armoured ammunition carrier) was also being built using the SdKfz 10 chassis. The type was fitted with a lightweight semi-armoured open cargo-type body so as not to overload the chassis. (Anderson)

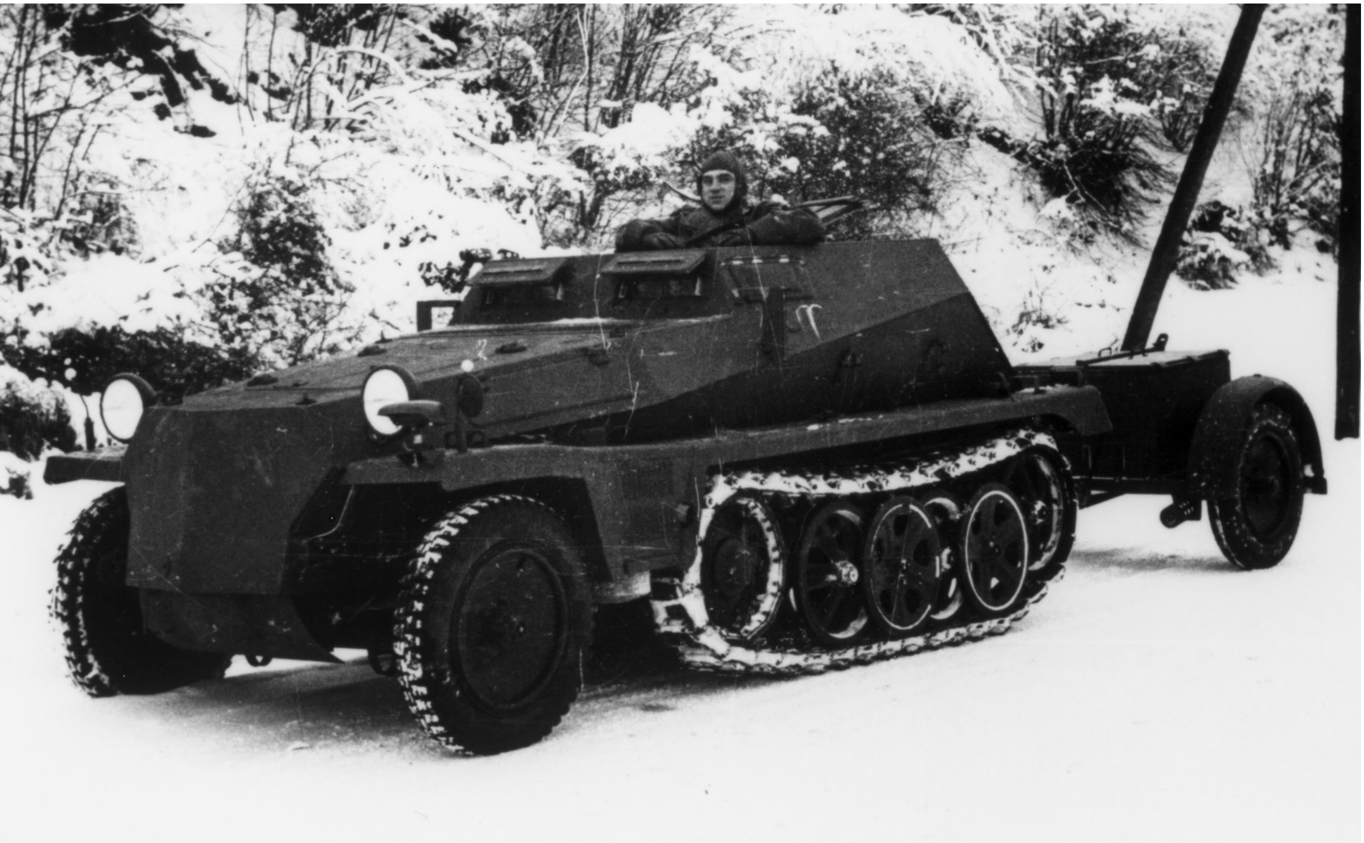
of sight and it also meant that the small aperture in the front plate was no longer required, thus eliminating a weak point in the frontal armour.

Ausf E

The Ausf E brought a major, important change. To allow the *Sturmgeschütz* to be used as a platoon or battery leader´s vehicle, a more sophisticated radio system was necessary. To provide space, the left-hand side ammunition bay was enlarged, and an identical bay was added on the right-hand side. One benefit of this modification was that an extra six rounds of 7.5cm ammunition could be stored, bringing the total up to 50.

Support Vehicles

The initial establishment of the *Sturmartillerie* called for two support vehicles to assist the sPaK in combat. The requirements profile for use with the sPaK demanded maximum mobility combined with armour protection against infantry armour-piercing bullets. At that time, Germany was a leader in the development of halftracked prime movers, which offered a very high mobility on paved roads and over rough terrain. The test vehicles were to be built using the chassis of the *leichte Zugkraftwagen* 1t (le ZgKw 1t) SdKfz 10.



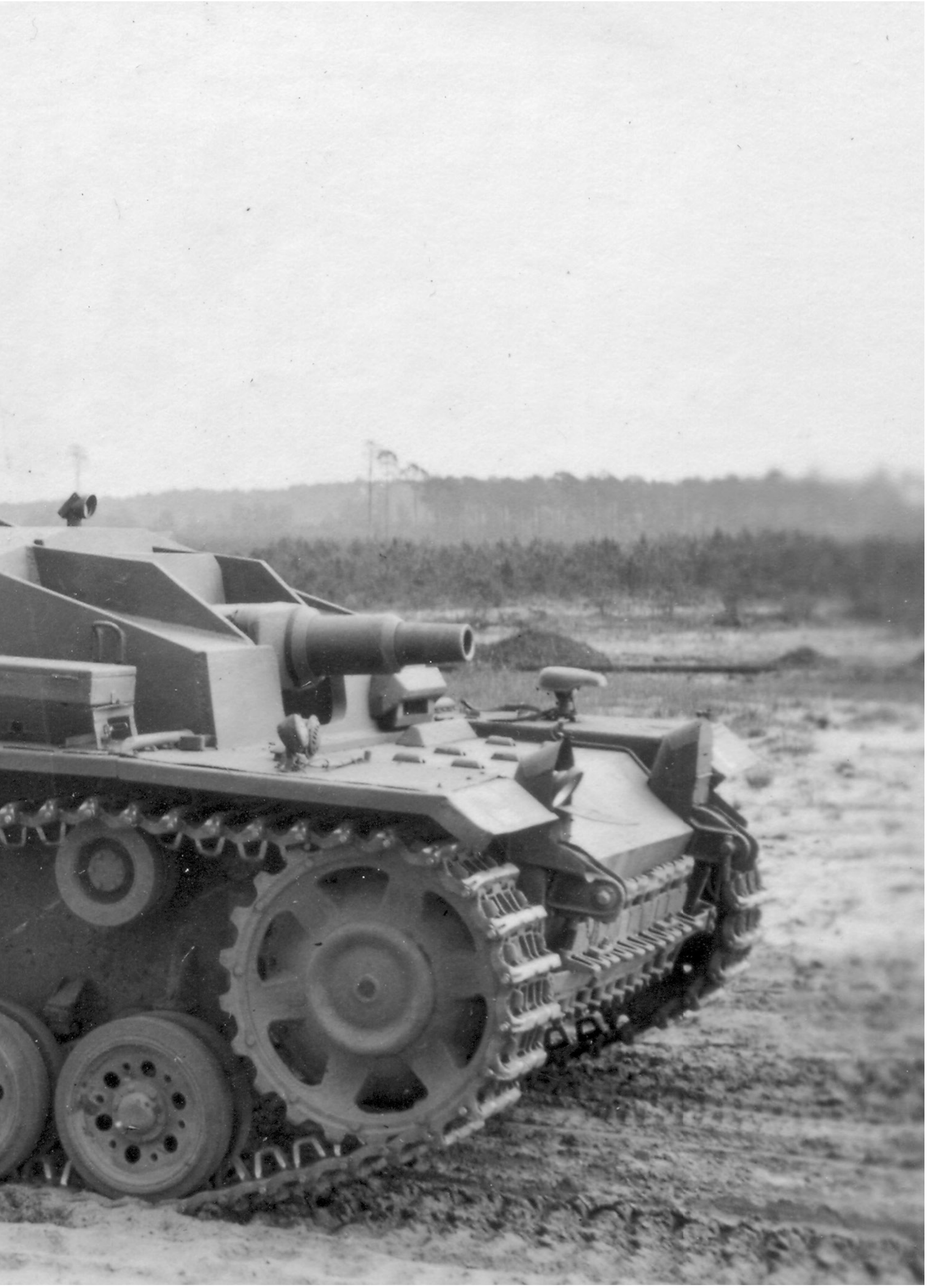
The SdKfz 253 was developed as the SdKfz 252 le gep MunKw. The vehicle carried a crew of two and 64 rounds of 7.5cm GrPatr ammunition. *A Sonderanhänger* (SdAnh 32) armoured light trailer carrying a further 64 rounds was usually towed. (Anderson)

SdKfz 253 – Observation Vehicle

The battery commander and platoon leaders were to be provided with light armoured halftracked vehicles designated *leichte Gepanzerter Beobachtungskraftwagen* (le gep BeobKw – light armoured observation vehicle). The vehicle would be fitted with extensive wireless equipment, and carry an observation officer, a wireless operator, an NCO observer (to be deployed outside the vehicle when required) and the driver. First prototypes were manufactured using the standard Demag D7 (SdKfz 10) chassis. These vehicles had an improvised ‘armoured’ superstructure, possibly fabricated from mild steel, and to save weight the production version used the shorter D7p chassis.

SdKfz 252 – Ammunition Carrier

To provide the sPaK with ammunition on or near the front line, a vehicle with similar capabilities was required. The *leichte Gepanzerter Munitionskraftwagen* (le gep MunKw) carried only a driver, a wireless operator and ammunition. As with the le gep BeobKw, one or more *Versuchsstücke* were produced on a standard D7 chassis. Here, too, the shortened version was finally selected. The vehicle could carry 64 rounds stowed at the rear and a further 64 rounds in a small *Sonderanhänger* 32 (SdAnh – special trailer 32).



This *Sturmgeschütz* Ausf E is fitted with enlarged side-storage boxes. The vehicle is fitted with FuG 15 and FuG 16 radio equipment as indicated by both antennae being erected. The scissors-type telescope for the commander is visible behind the *Selbstfahrlafette-Zielfernrohr* (Sfl-ZF) 1 periscopic gunsight. (Anderson)

Radio Equipment used by the *Sturmartillerie*

The new weapon system '*Sturmartillerie*' was equipped with UHF *Funkgerätesätze* (ultra-high frequency radio), compatible with all German artillery (and tank) units.

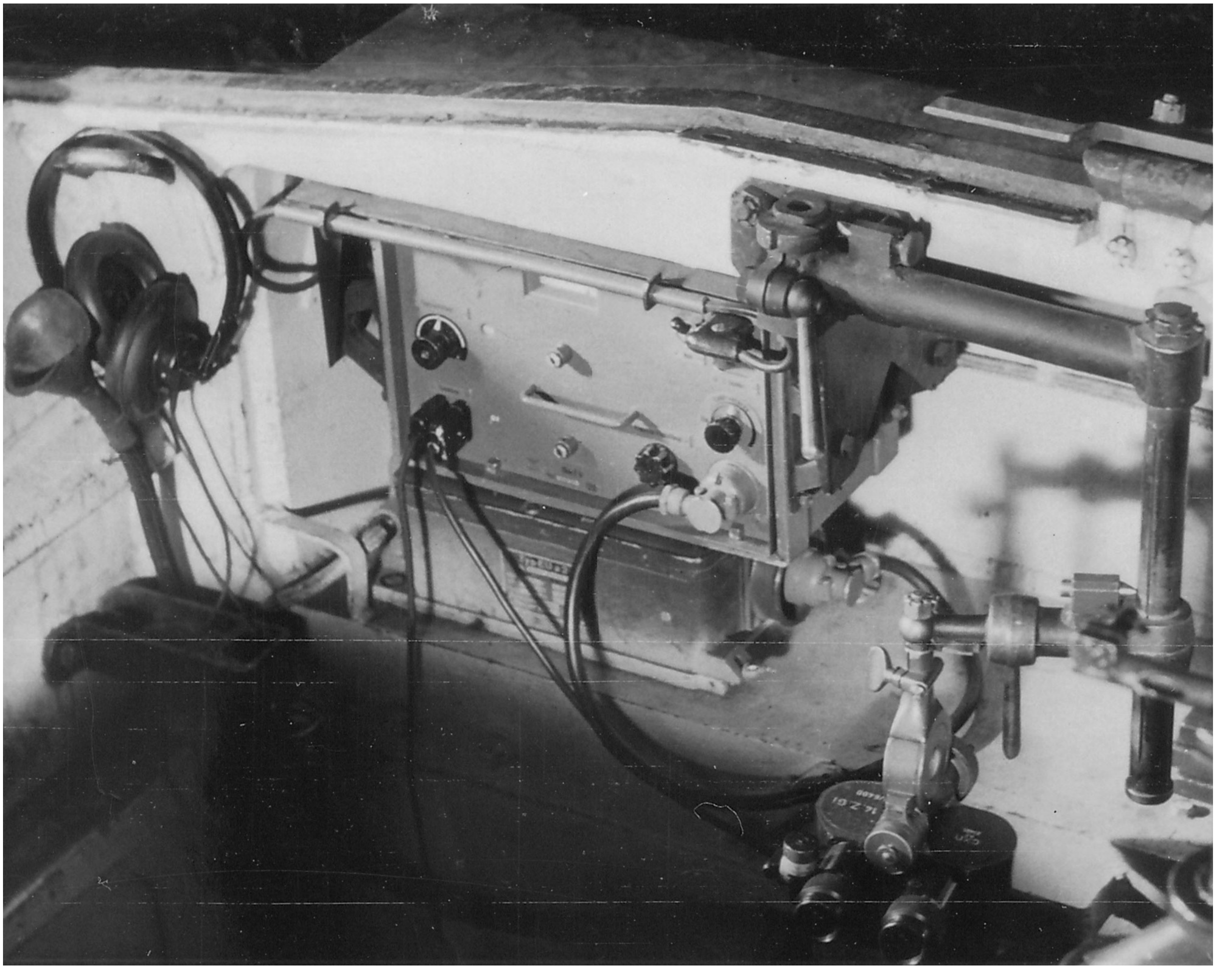
A platoon was the smallest unit in the *Sturmbatterie*. An observation officer in a *Führerwagen* (SdKfz 253) commanded two *Sturmgeschütz*. These would be supplied by a SdKfz 252 armoured ammunition carrier.

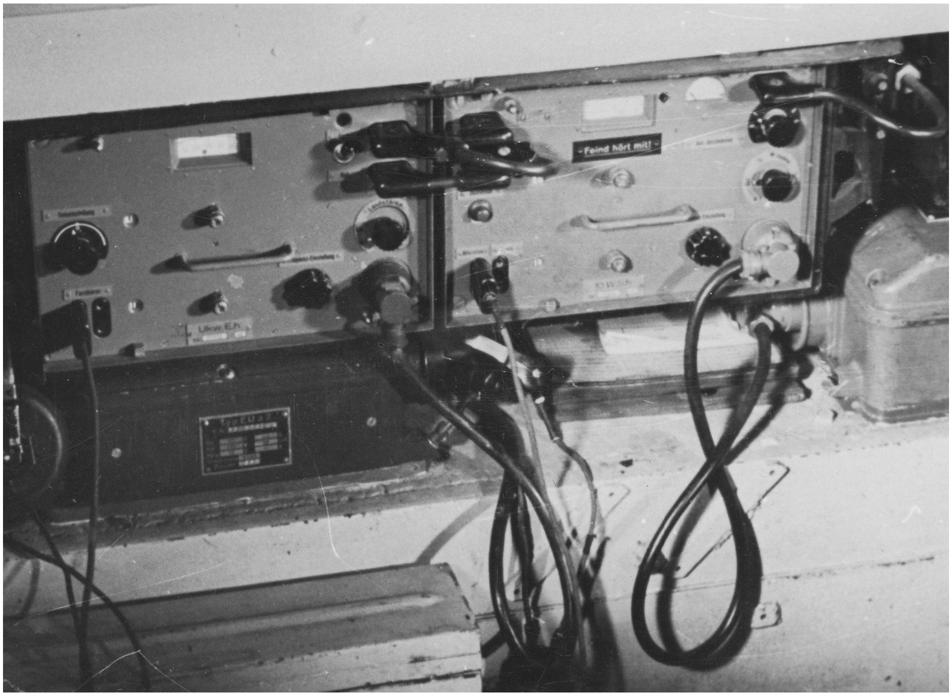
The *Führerwagen* were fitted with two receivers and one transmitter. The FuG 15 radio consisted of the UHF *Empfänger* h (receiver), the FuG 16 radio set consisted of the same UHF *Empfänger* h and a 10W transmitter h.

In 1940, all *Sturmgeschütz* were fitted with a FuG 15 radio. The crews were dependent on orders and instructions sent by the platoon commanders. All SdKfz 252s were fitted with the FuG 15.

Apparently, the intended tactical deployment of the *Sturmbatterie* did not require a transmitter/receiver to be fitted in every vehicle. For this reason all *Sturmgeschütz* were equipped with a receiver only. Due

The FuG 15 radio in the *Sturmgeschütz* was positioned to the left of the commander. The set consisted of the UHF *Empfänger* 'h' (receiver) with an *Umformer* (transformer) mounted below. A headset is hanging in the left corner, together with *Sprachrohr* (speaking tube). (NARA)





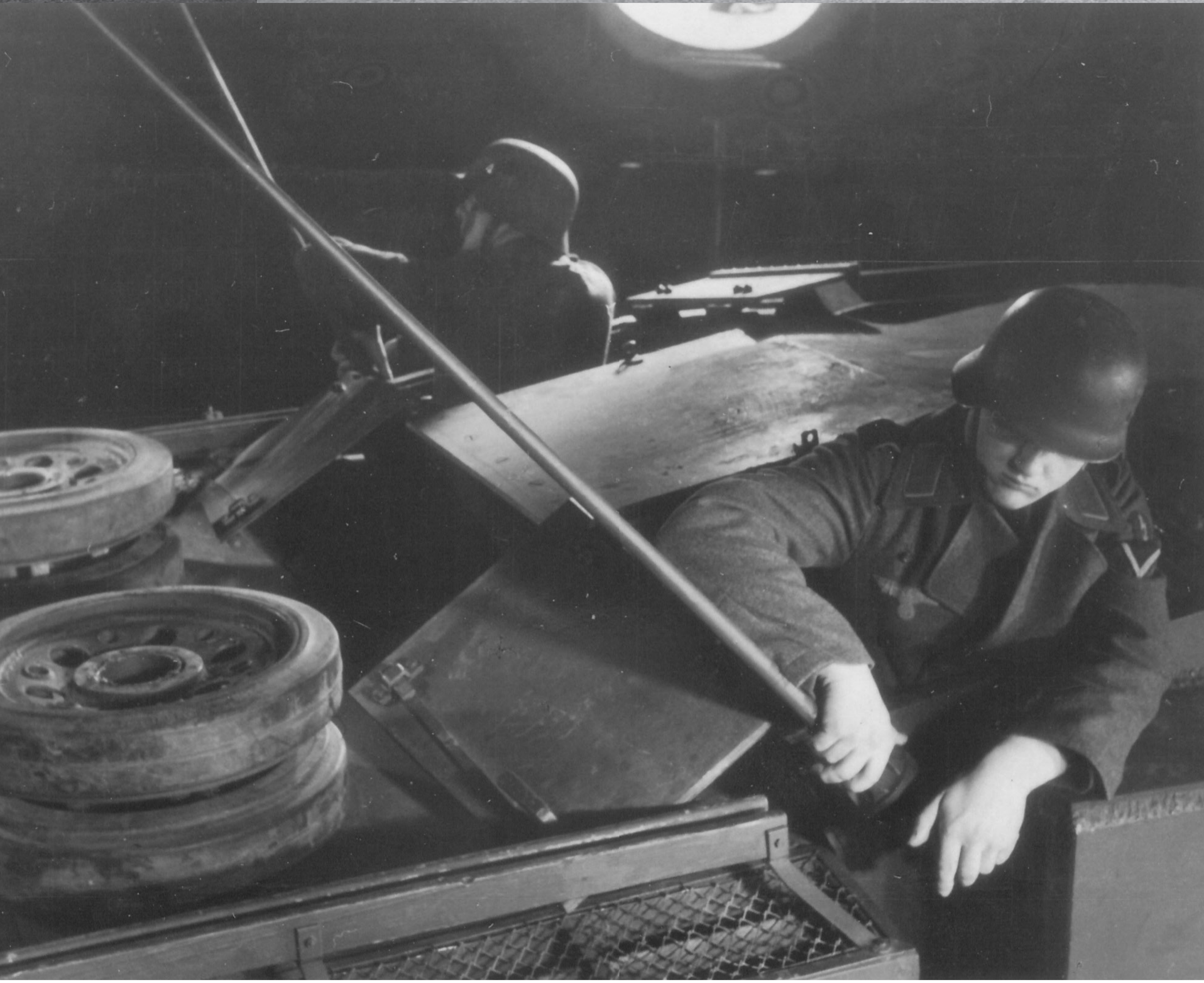
The *Sturmgeschütz* Ausf E, was equipped with an additional UHF *Empfänger* 'h' (receiver) and a 10W S 'h' (transmitter) Fu 16 radio. The equipment was mounted a bay on the right-hand side, with the transformers below. (NARA)

to this restriction, the *Sturmgeschütz* and *Munitionswagen* could only receive orders from the *Führerwagen*, so it was not possible for a vehicle commander to report his own battlefield observations or assessments to other *Sturmgeschütz* or to higher echelons.

This was totally opposite to practice in the *Panzerwaffe*, all their latest PzKfw III and IV tanks were each fitted with a FuG 5 and a FuG 2 radio. These radios were practically identical although they worked on different frequencies.

The preliminary training manual for the *Sturmbatterie* published in August 1940 stated:

> REGULATIONS REGARDING THE COMMUNICATION SYSTEMS
>
> *Führerwagen*:
>
> I.) The vehicle has the following communication means:
>
> a) Contact within the battery and to the *Abteilung*:
>   Radio system
>   Flag signals
>   Signal pistol
> b) Communication inside the *Führerwagen*:
>   A *Sprachrohr* [speaking tube] between commander and driver.



Before the radio could be operated, the crew had to erect the folded-down antennae. From the *Sturmgeschütz* Ausf F/8, the antennae were no longer foldable. (NARA)

III.) Radio ranges:

Führerwagen to *Führerwagen:*

Stationary	6 to 8km
Mobile	4 to 6km

Führerwagen to Geschützfahrzeug (*Sturmgeschütz*):

Stationary	4km
Mobile	2 to 3km

Tornisterfunkgerät h [portable radio] to *Führerwagen:*

	2 to 3km

IV.) Radio equipment:

Führerwagen: One 10W Sender h [transmitter]
Two UHF *Empfänger* h [receivers]
One *Tornisterfunkgerät* h [portable radio]

Sturmgeschütz: One UHF *Empfänger* h with speaker

Munitionswagen: One UHF *Empfänger* h

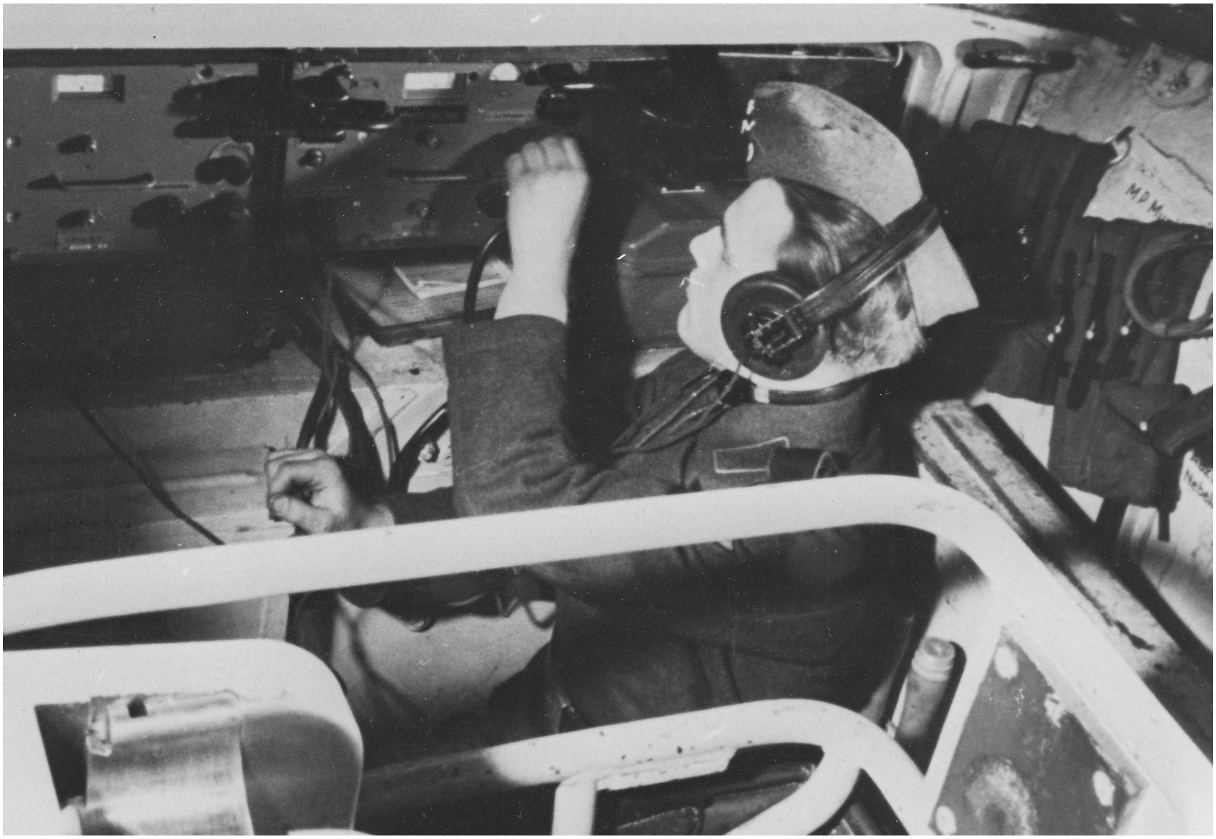
V.) *Sturmgeschütz*: radio equipment

Contact with the *Führerwagen*: UHF *Empfänger* h or Flag signals

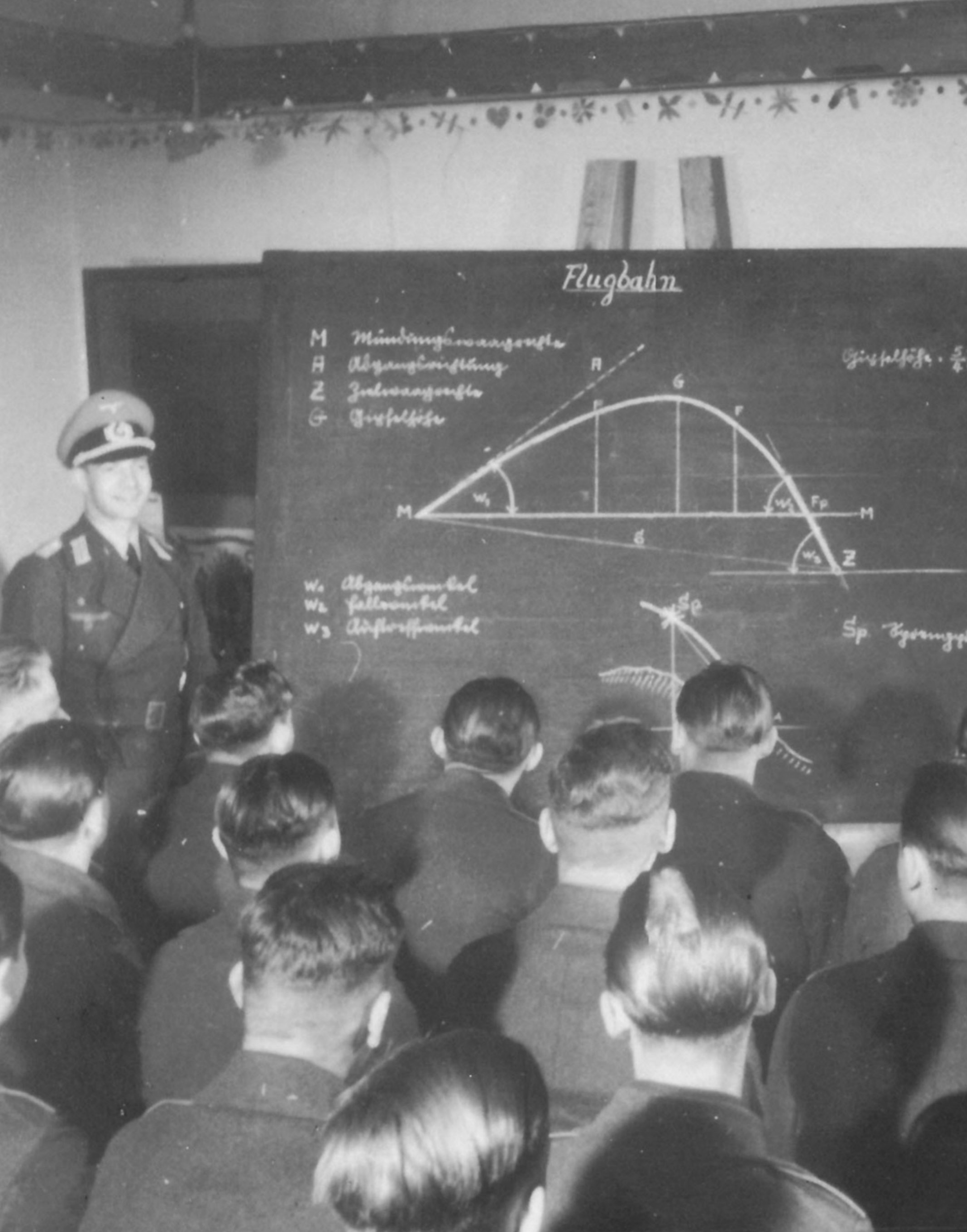
Communication inside the *Sturmgeschütz*: *Sprachrohr* [speaking tube]

VI.) *Munitionswagen*, radio equipment:

Each platoon has one *Munitionswagen*, which is equipped with a UHF *Empfänger* h. The same regulations for the *Sturmgeschütz* also apply to this vehicle.



The FuG 16 radio was operated by the loader. To the right are the ammunition bags for the two *Maschinenpistole* (MP) 38 self-defence weapons. (NARA)


Flugbahn
M Mündungswaagerechte
A Abgangsrichtung
Z Zielwaagerechte
G Gipfelhöhe
Gipfelhöhe · 5/4
A
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W1
W2
W3
W1 Abgangswinkel
W2 Fallwinkel
W3 Auftreffwinkel
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Sturmartillerie: Creation and Organization

2

In 1936, orders were given to the *Artillerie-Lehr-Regiment* (ALR) to establish the infrastructure required for building up the new branch of service. The home of the ALR was in Jüterbog, a small garrison town in the wide, glacier-ridged landscape of the Magdeburger Börde near to Berlin. The first military units arrived here in the middle of the 19th century. Within a short period the town emerged to be the largest military garrison in the Reich. A large exercise and training area was quickly established on the open plains to satisfy the requirements of many different units.

The nucleus of the new service branch was established by 7/ALR, at that time a battery-sized unit. Here the technical and organizational structures were slowly developed to work out basic principles for operational use. As a 'blueprint', the standard structure of artillery units was chosen. Training commenced almost immediately after establishment, by using available equipment and vehicles. The first sPaK prototypes would play an important role.

Karl-Friedrich Bohlender, who was an officer in the *Artillerie-Lehr-Regiment* at that time, recalls:

> The trials of the first *Versuchsfahrzeuge* (test vehicles) were carried out on the Jüterbog training area under utmost secrecy. At the beginning of 1939, an extraordinary incident took place. As had happened several times before, a Soviet military delegation visited the school of artillery at Jüterbog. Although there was still some limited cooperation between the Reich and the Soviet Union, the Russian officers were not to learn about the *Sturmgeschütz*. However, when some of the vehicles returned from the gunnery range, the delegation spotted the new tanks accidentally. Quickly they raised their cameras and took pictures; nobody could refuse the guests. This event was reported to the high command immediately and, apparently, a solution was quickly found.

Sturmartillerie trainees being instructed in the 'science' of ballistics: Before the first *Sturmgeschütz Ersatz und Ausbildungsabteilungen* (StuGErsAusbAbt) was established, all training was carried out by *Artillerie-Lehr-Regiment* (ALR) at Jüterbog. (NARA)

A mere hour later, an official invitation was extended to the delegation: A new *Luftwaffe* prototype airfcraft would be presented to them at Berlin Tempelhof airport. When they arrived, they were led through the technical department in the basement. Here a concealed X-ray gun was used to expose the films in their cameras, destroying the images unnoticed.

Production

Series production of the sPaK was to start in 1939, with an initial order for 280 vehicles. But due to numerous minor production and delivery problems, delivery dates and targets were never achieved.

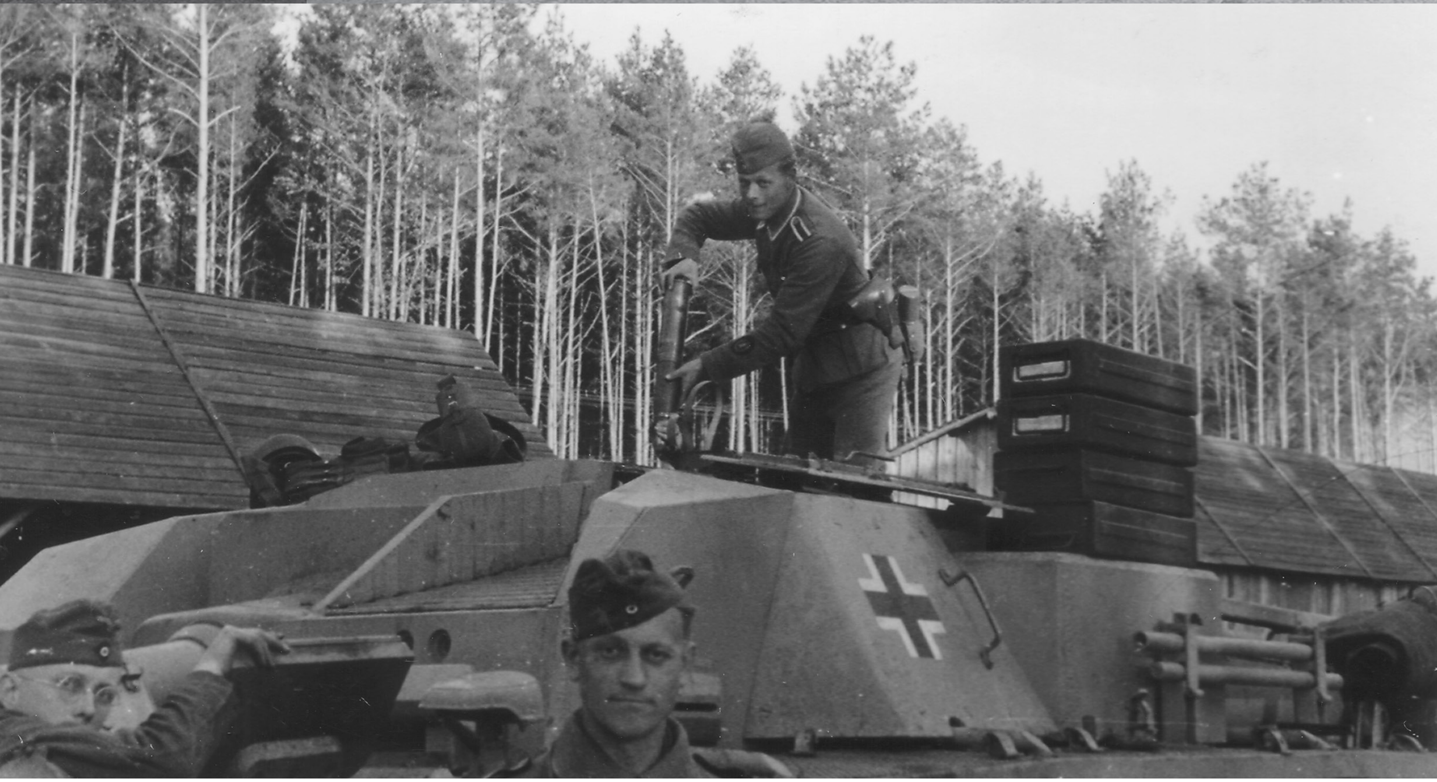
On 13 October 1939, the *Waffenamt* (ordnance bureau) summarized the production of the sPaK:

Many *Sturmgeschütz* units were established at *Artillerie-Lehr-Regiment* (ALR) Jüterbog. Here 18 *Sturmgeschütz*, mainly Ausf E, are ready to be handed over to a newly formed unit. (Hoppe)

Subject: PzSfl III (sPaK):

1.) Development of PzSfl III (sPaK) is completed, introduction application is requested.
2.) At hand are five units, armed but with mild-steel superstructure.
3.) Output O-series of 30 units:
    End of December 1939 through 1 April 1940
    Output second series of 250 units:
    From April 1940, twenty units per month, smooth production assumed.

Waffenamt Prüfwesen 6 (WaPrü 6 – ordnance department, armaments branch – motor vehicles) maintained and updated lists for production and



A *Sturmgeschütz* Ausf B being replenished with ammunition prior to moving out for a live-firing exercise at Jüterbog. Each ammunition box contained three 7.5cm rounds. (von Aufseß)

acceptance of armoured vehicles. This list also gave information about the planned production.

In June 1939, this production plan was as follows:

Actual Production 1940	sPaK	SdKfz 253	SdKfz 252
January	1	–	–
February	3	–	–
March	6	1	–
April	10	9	–
May	10	10	5
June	12	5	5
July	12	–	17
August	10	10	3
September	29	–	–
October	35	25	20
November	35	19	16
December	21	–	5

The first order was for 280 sPaK, of which 30 were O-series (later designated *Sturmgeschütz* Ausf A) plus 250 of the series production (*Sturmgeschütz* Ausf B). In September, it was decided that production would begin in December with one unit scheduled. In this list, the sPaK was still stated as *Entwicklungsgerät* (equipment under development). In January 1940, it was planned to produce six units, and then ten per month starting in February. The target was to produce 30 *Sturmgeschütz* per month by December 1940.

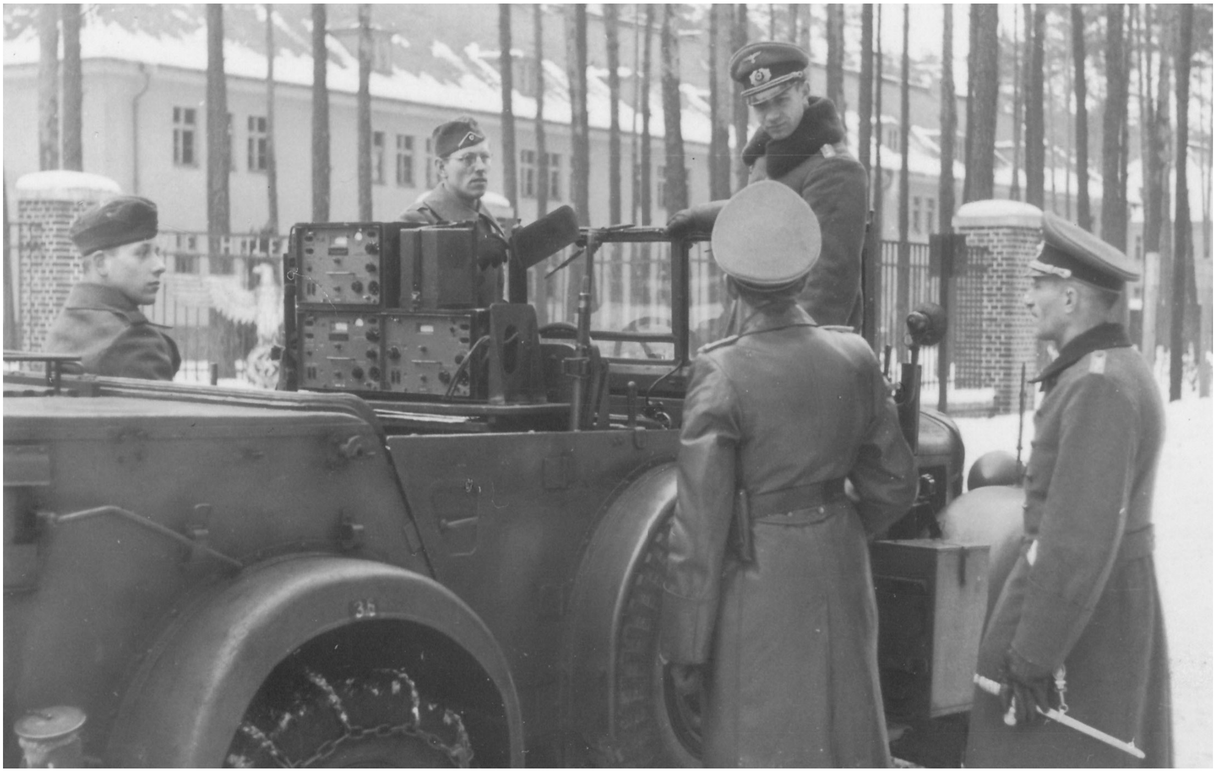
The production target for support vehicles was detailed as 55 SdKfz 252 and 253 in total. According to the list, production was to commence in February 1940 with one vehicle of each type. However, problems with the delivery of the D7p chassis from Demag were reported in January 1940.

Delivery Problems

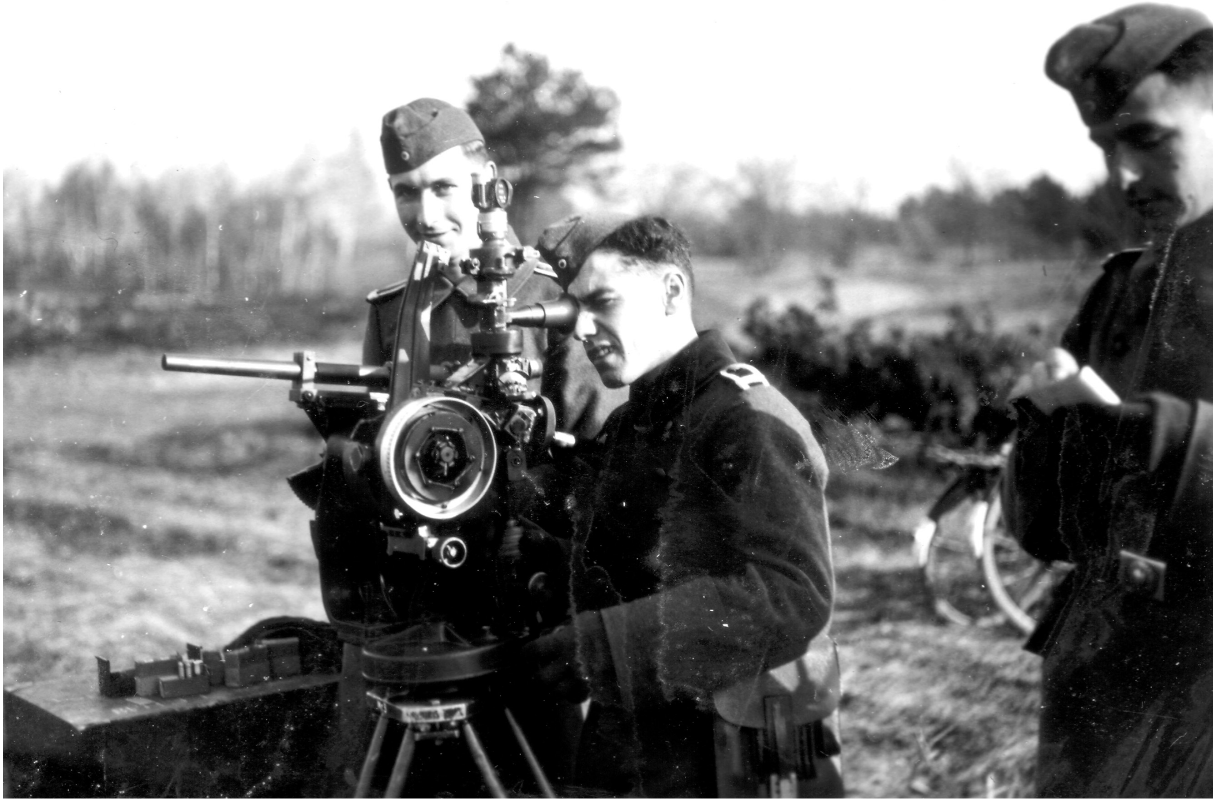
The start of production was delayed due to numerous problems. Apparently there were frustrating conflicts of competence within the different branches of the ordnance department. Furthermore, Hitler made frequent personal interventions, issuing *Führerbefehle* (direct order of the *Führer*) to influence certain armaments projects. The manufacturers also had to deal with outside suppliers, which faced the same delivery problems with semi-finished parts or the lack of raw materials.

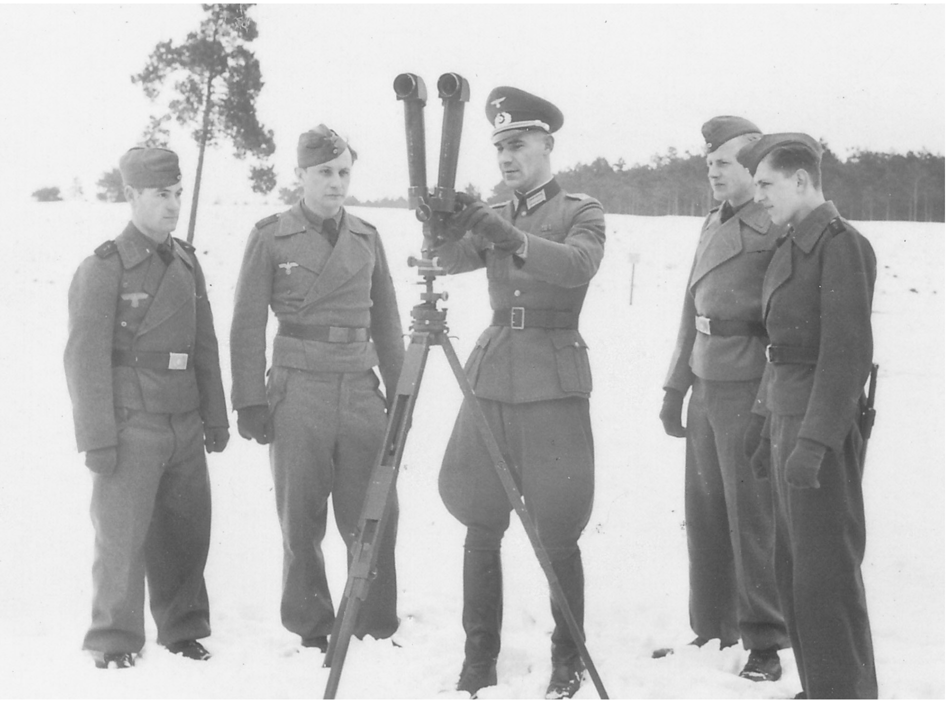
The start of *Sturmgeschütz* production was delayed several times. A major problem, among many others, was the gun. Production of the 7.5cm K (PzSfl), a derivative of the 7.5cm K for the BW, commenced late in January 1940, and only three were produced by the end of the month. From April, production was increased to an average of ten *Sturmgeschütz* each month, but these figures were still regarded as being too low. The *Waffenamt* A, urged an increase in the production, as evident in a note dated 3 June 1940:

> The commander-in-chief of the army puts special emphasis to boost production of *Sturmgeschütz* by all means, exceeding all previous estimates.



A Kfz 15 *Funkkraftwagen* (radio car), in service with the *Batterietrupp* of a *Sturmbatterie*, equipped with FuG 15 and FuG 16 radios. The vehicle is at the gates of *Adolf Hitler Lager* (camp), one of the garrisons at Jüterbog: Note the snow chains fitted to the tyres. (NARA)





Above: A gunner being shown how to use the *Kleinkalibergerät* (small-calibre device) – which used small-calibre ammunition to simulate combat fire – fitted to a *Rundblickfernrohr* (RblF) 32, the standard gun sight fitted in early *Sturmgeschütz*. This type of device was still being used in 1980, when the author underwent artillery training. (NARA)

Right: An officer instructor demonstrates the operation of the *Scherenfernrohr* (scissors telescope) to a group of *Sturmartillerie* trainees. By the end of 1940, most soldiers of the *Sturmartillerie* wore the *feld grau* (field grey) service uniform.

Regarding the support vehicle, *Waffenamt* A delivered a note to the commander-in-chief of the army on 11 April 1940:

> Subject: Delivery of armoured observation vehicles for *Sturmartillerie*, SdKfz 253.
>
> 1.) Delivery of *gepanzerte Beobachtungskraftwagen* (gep BeobKw) and *gepanzerte Munitionskraftwagen* (gep MunKw) [SdKfz 253 and 252, author] which was to start in parallel with the production of *Sturmgeschütz* has been hindered for the following reasons:
>
> a) Due to the present situation, production had to start without a *Versuchsserie* (test series). Many problems emerged which were unavoidable.
>
> b) The delayed delivery of parts by sub-suppliers caused by difficult material sourcing led to further problems.
>
> c) Withdrawal of the workforce.
>
> 2.) Following new negotiations with Demag and Wegmann, the companies involved in the production of the gep BeobKw and gep MunKw. It was decided to produce gep BeobKw with priority over the gep MunKw. Thus it will be possible to deliver ten gep BeobKw by the end of April, enough to equip two batteries of *Sturmgeschütz*.

As part of their training recruits were instructed on how a shell worked, how to identify each type of ammunition and how to handle it safely in the close confines of a *Sturmgeschütz*.

The production figures were realistic, so this plan could be achieved. Indeed production of the SdKfz 252 and 253 was regarded as so important that material was withdrawn from the production line of the SdKfz 251/12 *mittlerer gepanzerter Mannshaftstransportwagen* (m gep MTW – medium armoured personnel carrier). In a further letter, the ordnance department noted that the long-term production plans showed a reduction in light armoured reconnaissance vehicles in favour of support vehicles for the *Sturmartillerie*. Both SdKfz 252 and 253 were now rated 'S'; *Schwerpunktgerät in Sonderstufe* (special priority material).

Even production numbers for the SdAnh 32 ammunition trailer, which could not be described as a piece of complicated equipment, were never reached during 1940. For example, in December only 40 of the 60 trailers ordered were delivered, the reason given being; 'difficulties in procuring axles'.

The report makes note of one *Sturmgeschütz*, damaged during the invasion of France, which is reported to have been repaired by end of November.

In contrast, in December 1940 only 102 out of 120 PzKpfw III (5cm) ordered were produced, but all 30 Pzkpfw IV ordered were delivered.

The First Units

Sturmgeschütz, intended to provide support to the infantry, was to play a vital role in the assault on France. However, the slow production of assault guns and their support vehicles considerably slowed down the formation of these units.

The initial planning saw a battalion-size unit subordinated under an infantry division to provide close support during the assault. By early 1940, the slow production rate did not allow this to happen.

The KStN – Bureaucracy

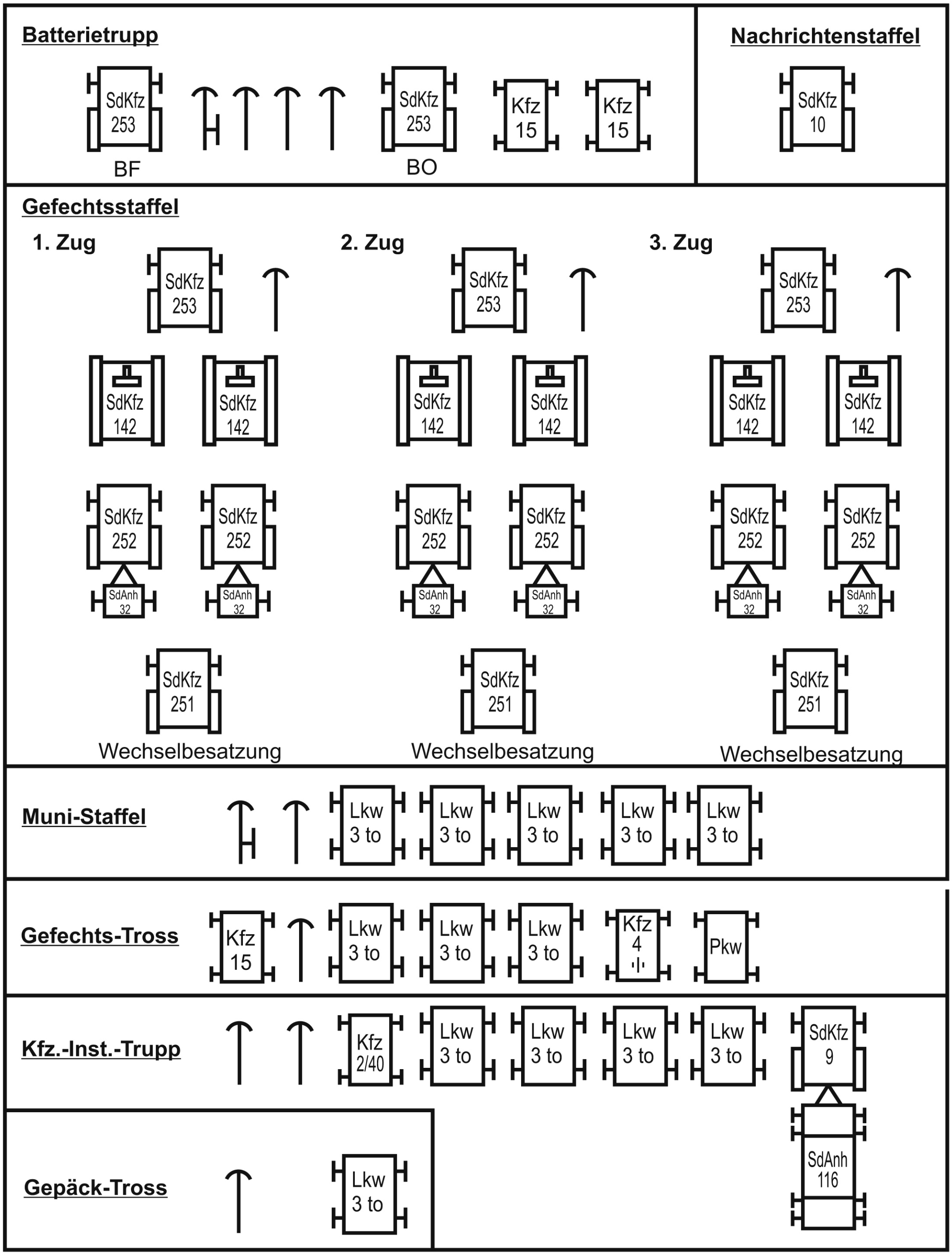
German military units, from the smallest to larger formations, were organized according to standardized organizational structures. The *Kriegsstärkenachweisung* (KStN – table of organization) described the actual numbers of vehicles, weapons and men. The *Kriegsausrüstungsnachweisung* (KAN – basic allowances) for each unit. Since the latter included almost everything from a typewriter to a torch, it was far more comprehensive. For that reason I shall concentrate on the KStNs.

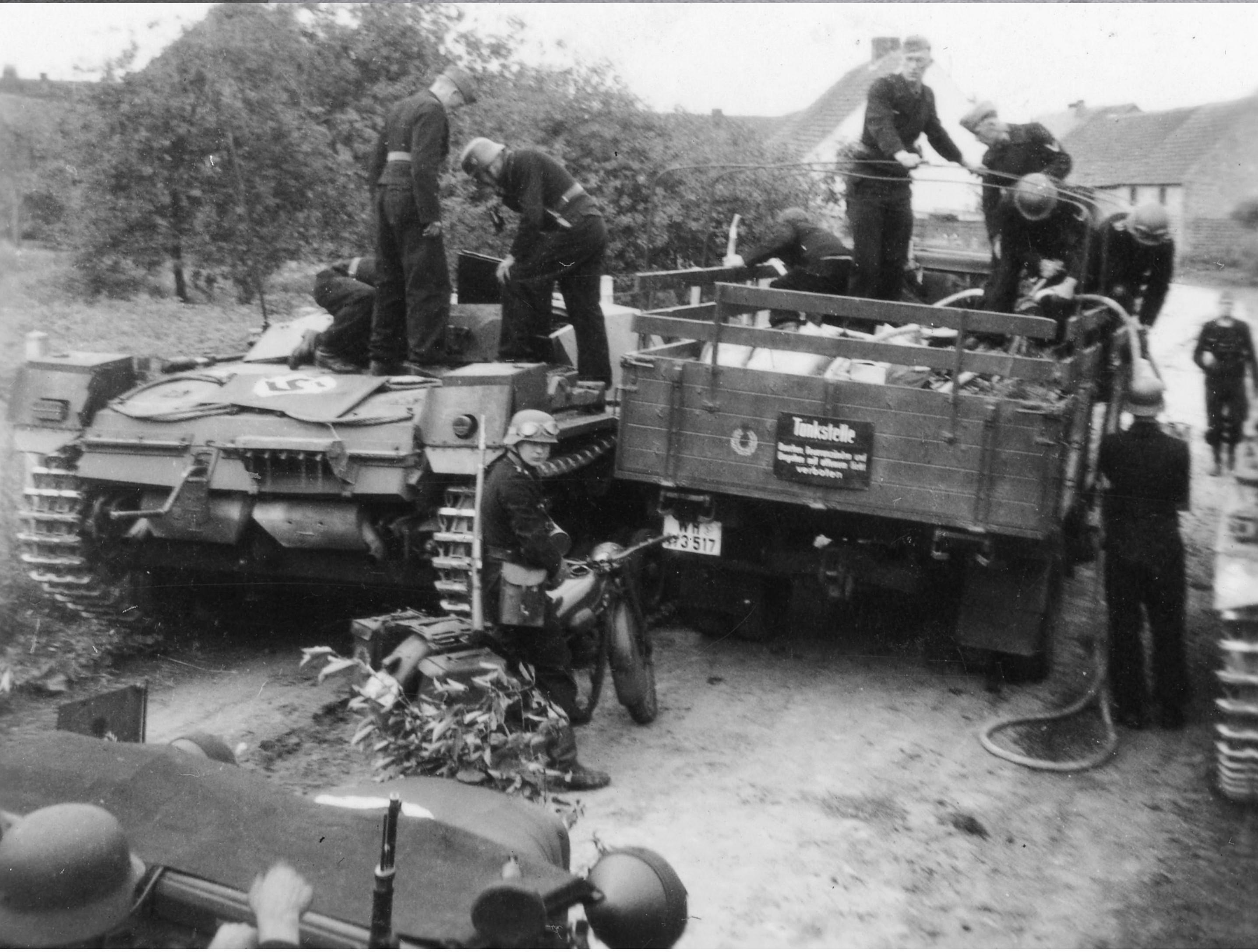
However, over time the actual equipment changed due to new tables of organization. In the field, units received reinforcements and new deliveries when necessary, and, more importantly when these were available. For this very reason the actual strength reports given by the staff to the higher echelons were not always correct. Surplus equipment was simply not reported so that it could be retained. Subsequently front-line units had to be content with what was available. Often enough, replacements were not available, which resulted in some units having a theoretical combat strength.

Work on the organizational structures for the *Sturmartillerie* commenced in 1939, and closely followed the structures of other comparable artillery units. The slow production of *Sturmgeschütz* made it impossible to form a complete *Sturmgeschütz-Abteilung* with three *Sturmbatterien* before the

Sturmbatterie

Table of organization according to KStN 445, dated 1 November 1939


Batterietrupp
SdKfz 253
BF
SdKfz 253
BO
Kfz 15
Kfz 15
Nachrichtenstaffel
SdKfz 10
Gefechtsstaffel
1. Zug
SdKfz 253
SdKfz 142
SdKfz 142
SdKfz 252
SdAnh 32
SdKfz 252
SdAnh 32
SdKfz 251
Wechselbesatzung
2. Zug
SdKfz 253
SdKfz 142
SdKfz 142
SdKfz 252
SdAnh 32
SdKfz 252
SdAnh 32
SdKfz 251
Wechselbesatzung
3. Zug
SdKfz 253
SdKfz 142
SdKfz 142
SdKfz 252
SdAnh 32
SdKfz 252
SdAnh 32
SdKfz 251
Wechselbesatzung
Muni-Staffel
Lkw 3 to
Lkw 3 to
Lkw 3 to
Lkw 3 to
Lkw 3 to
Gefechts-Tross
Kfz 15
Lkw 3 to
Lkw 3 to
Lkw 3 to
Kfz 4
Pkw
Kfz.-Inst.-Trupp
Kfz 2/40
Lkw 3 to
Lkw 3 to
Lkw 3 to
Lkw 3 to
SdKfz 9
SdAnh 116
Gepäck-Tross
Lkw 3 to



A *Sturmgeschütz* Ausf B being refuelled from a 3-ton truck during a training exercise at Jüterbog. Note the starting handle is in position to crank-up the engine in order to save battery power. The unit badge of *Artillerie-Lehr-Regiment* is painted on the rear of the truck. (Anderson)

invasion of France, as originally planned. Thus it was decided to establish single batteries progressively, to be equipped with *Sturmgeschütz* as they were delivered.

The units were to be formed according to KStN 445, dated 1 November 1939. Beside soft-skinned vehicles, six sPaK (*Sturmgeschütz*), five gep BeobKw (SdKfz 253), six gep MunKw (SdKfz 252) and three gep MTW (SdKfz 251/12) were authorized for each battery. The latter vehicles, personnel carriers, were fabricated from mild steel and intended to transport replacement crews for the *Sturmgeschütz* in the field.

Since the independent *Sturmbatterien* could not rely on the infrastructure of a larger unit, all supplies had to be forwarded or provided by their infantry unit. To recover a damaged *Sturmgeschütz*, the workshop platoon of the *Sturmbatterie* was supported by a recovery team equipped with a *schwere Zugkraftwagen* (sZgKw – heavy halftrack tractor) 18t (SdKfz 9) and a *Sonderanhänger* (SdAnh) 116 heavy flat-bed trailer.

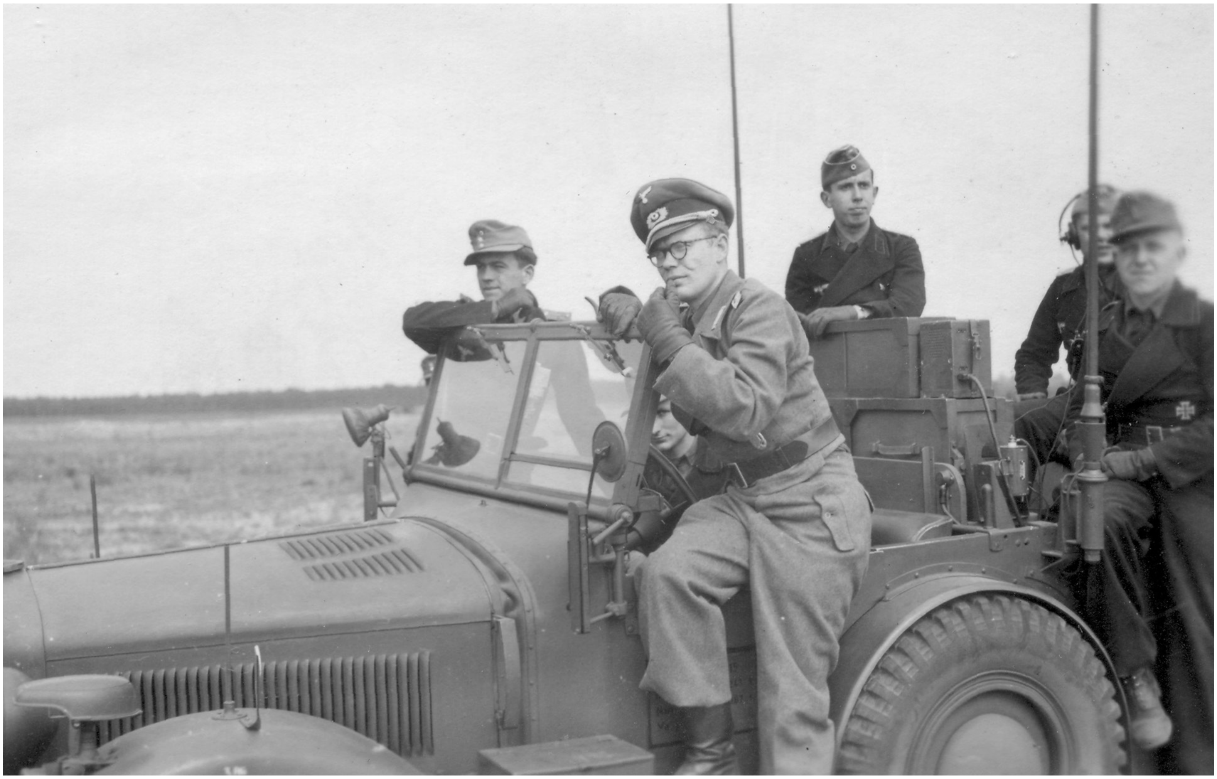
The planned dates of formation of the *Sturmgeschütz* units were:

Sturmbatterie 640	1 November 1939
Sturmbatterie 659	23 March 1940
Sturmbatterie 660	23 March 1940
Sturmbatterie 665	30 March 1940
Sturmbatterie 666	30 March 1940
Sturmbatterie 667	28 May 1940

The establishment of these units took place but was hampered by difficulties and delays. The small number of *Sturmgeschütz* available led to a slow delivery to the single units. As the table shows, production of support vehicles proceeded even more slowly, making the equipping of *Sturmbatterien* very difficult. Instead of receiving the important SdKfz 253 some units received substitutes, either PzKpfw I Ausf A or the *kleine Panzerbefehlswagen* (kl Pz BefWg – command tank).

The SdKfz 252 was easier to replace, and in most cases the SdKfz 10 was used. One unit, *Sturmbatterie* 660, received six modified PzKpfw I Ausf A hulls for use as ammunition carriers.

Limited numbers of SdKfz 251/1 which had been fitted with a roof (fabricated from mild steel) over the open bodywork were also available. If these were not available then a standard le ZgKw 3t (SdKfz 11) was used as a substitute.



Officers and men of a *Sturmbatterie Abteilung* during a training exercise at Jüterbog, in the summer of 1940. The Kfz 15 *Funkkraftwagen* is equipped with FuG 15 and 16 radios and two 2m rod antennae.

Manpower

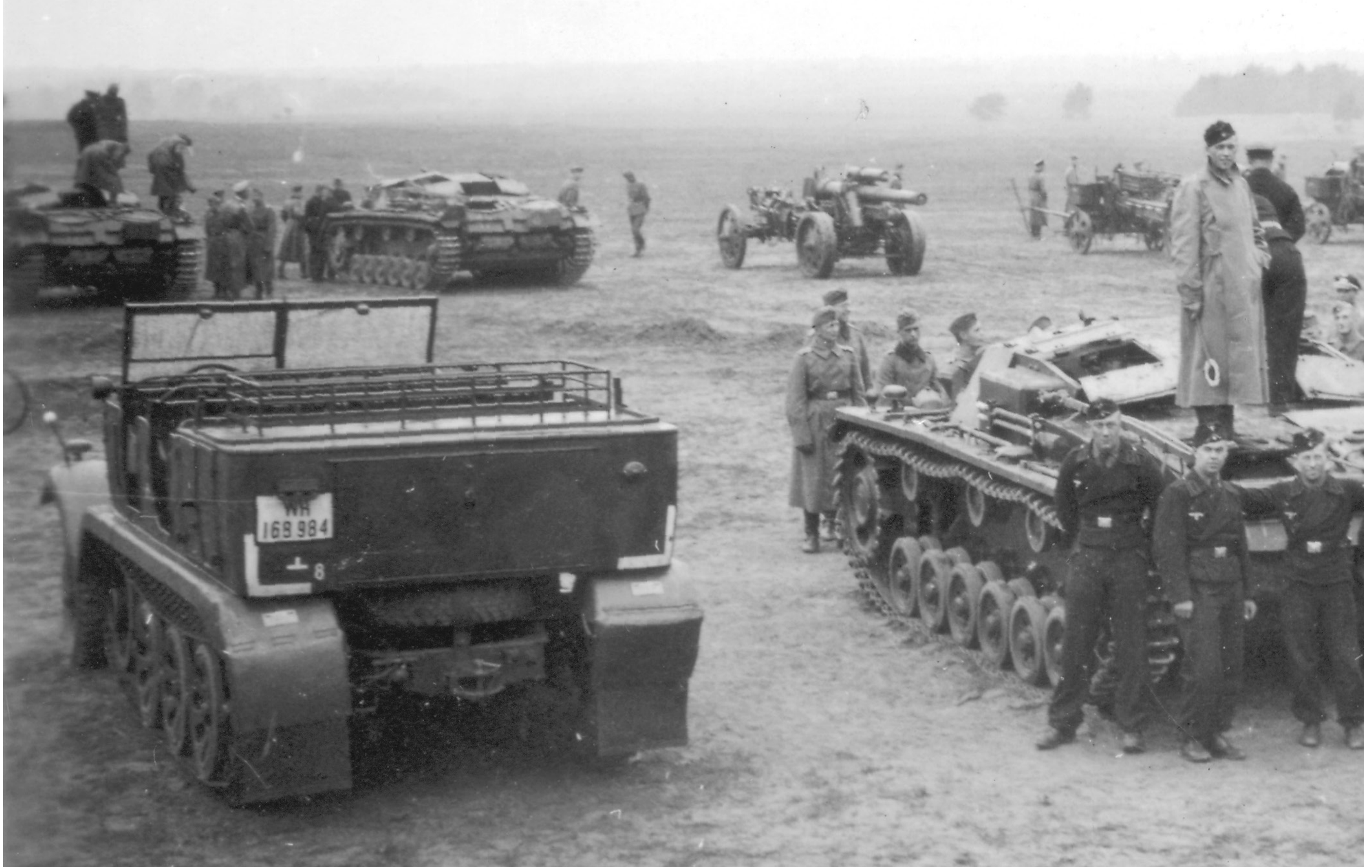
In February 1940, the *Organisationsabteilung* demanded:

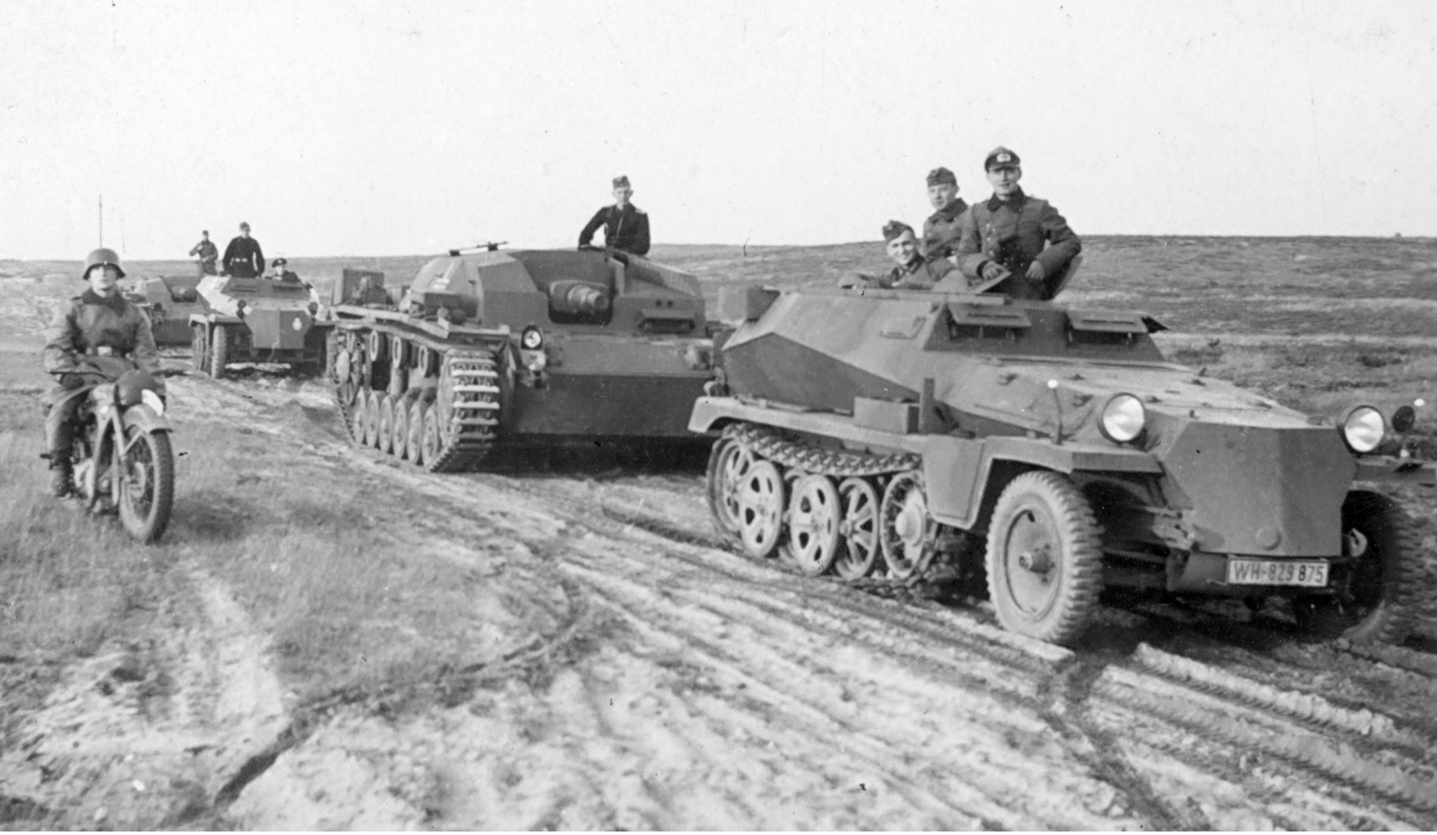
> Subject: Volunteers for infantry escort artillery
>
> For the establishment of armoured *Sturmgeschütz* batteries non-commissioned officers and *mannschaften* (conscripted men) of the artillery will be needed. These have to be recruited from volunteers only in the artillery regiments of infantry divisions… Only fully-trained, independently acting and combative non-commissioned officers (vehicle commanders, platoon leaders) and conscripted men (gunners, radio operators) can be considered.
> The identity of the service (armoured *Sturmartillerie*) will be reported only to army officials and has to be kept secret. All voluntary reporting will be referred to under the designation: infantry escort artillery.
>
> The following are ordered to supply:

Army group A	45 NCOs	120 men
Army group B	25 NCOs	60 men
Army group C	20 NCOs	70 men

> All those volunteers selected are to be sent to the artillery school Jüterbog.

Below: This interesting collection of weapons was possibly photographed before an exercise at Jüterbog. Beside a number of *Sturmgeschütz* and light halftracks, there are SdKfz 7 tractors and several heavy artillery pieces. (Anderson)





Above: Elements of a *Sturmgeschütz Zug* (platoon) – an SdKfz 253 *Führerwagen*, two *Sturmgeschütz*, and an SdKfz 252 ammunition carrier – on the Jüterbog training grounds. Motorcycles played an important role for communications during the early stages of the war, but proved unsuited to the mud and snow of the Soviet winter. (Anderson)

Assault in France

3

When Hitler launched *Fall Gelb* (Plan Yellow) on 10 May 1940, the invasion of the Low Countries and France, it had been planned for five *Sturmbatterien* to be ready for combat. However, in May 1940 these plans were far from reality. There was a shortage of all types of equipment: *Sturmgeschütz*, *Munitionswagen* (SdKfz 252) and command vehicles; even the required number of soft-skinned vehicles. Most of which were delivered shortly before 10 May, some even later.

Being artillery units organized at *Heerestruppen* (army troop) level, the *Sturmbatterien* were to be attached, for a specified period, to various infantry units depending on army requirements. The planned organization under a larger battalion-size *Sturmgeschütz* unit did not happen due to a lack of equipment.

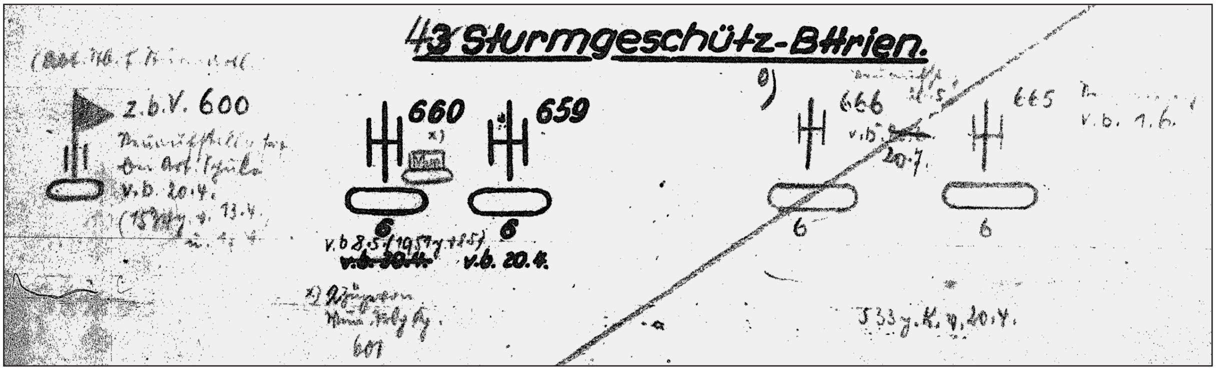
Sturmbatterie 640, the first *Sturmartillerie* unit to be combat ready, was almost instantly (8 April 1940) attached to *Infanterie-Regiment Großdeutschland*. Despite the original plans, StuBttr 640 would remain with this unit and become an integrated part of *Großdeutschland*. For this reason the battery was not mentioned in the Order of Battle, drawn up by the army troop section.

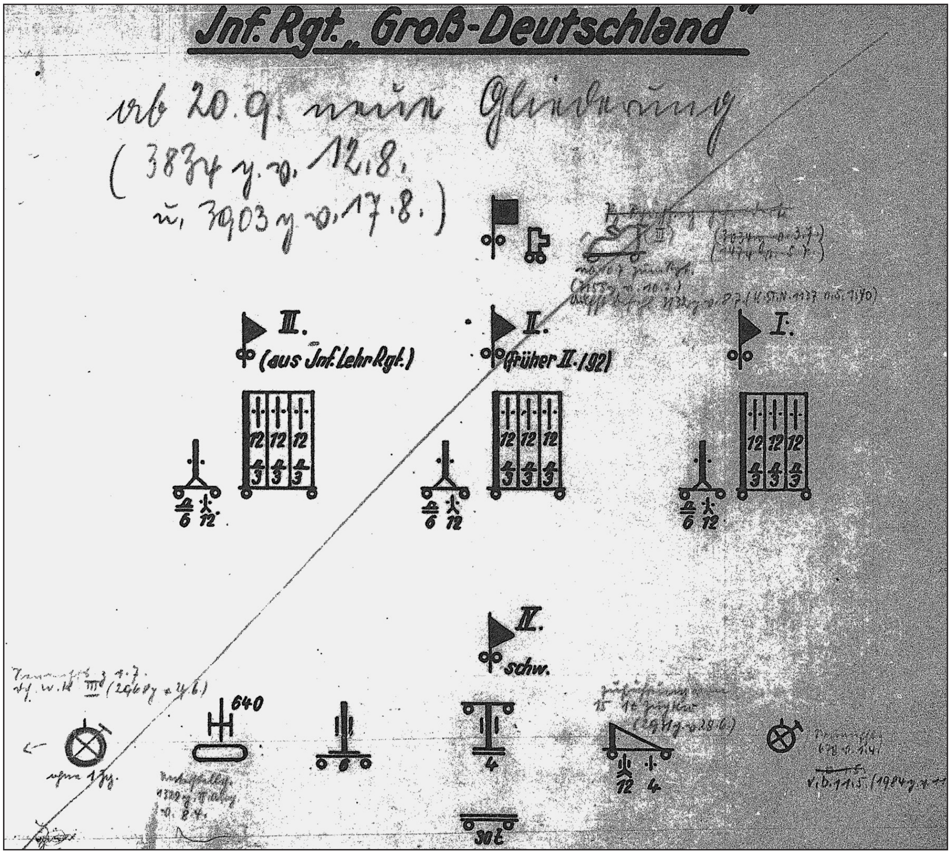
As shown in the Order of Battle, published on 15 April 1940 (which was repeatedly changed by hand), only three assault batteries were combat ready at that time. *Sturmbatterie* 659 was to be ready on 20 April, followed by 660 on 8 May. As shown in the chart overleaf, *Sturmbatterie* 660 was reinforced by *MunitionsTransportkompanie* (munitions transport company) 601 issued with *Munitionspanzer* (ammunition-carrying tanks) to replace the missing Sdkfz 252.

Sturmbatterie 665 was established on 9 May 1940 with the prospect of being combat ready by 1 June. The unit crossed into France on 10 June.

The over-sized *Balkenkreuz* on this *Sturmgeschütz* Ausf A was a distinctive feature of *Sturmbatterie* (StuBttr) 666. After the unit was withdrawn from France, at the end of hostilities, it was sent to Ghent, Belgium where it was to participate in the preparatory exercises for Operation *Sealion*. (Anderson)

From the organizational aspect, at least for the near future, the *Abteilung* made up of three *Sturmbatterien* was to be the normal structure. To test this, a shadow *Abteilung*, StuGAbt 600zbV (zbV – *zur besonderen Verwendung* – for special duties) consisting of a staff section only, was established. This element should be ready for the formation of the first regular *Abteilungen*, which started after the French campaign. Later in 1942, StuGAbt 600zbV was transformed into a combat unit by amalgamating with *Sturmbatterien* 660 and 665, which had remained independent until this time.


43 Sturmgeschütz-Bttrien.
z.b.V. 600
660
659
666
665
6
6
6
6
v.b. 20.4.
v.b. 1.6.
20.7.
601
533 g.K. v. 20.4.


Jnf. Rgt. „Groß-Deutschland"
ab 20.9. neue Gliederung
(3834 g.v. 12.8.
u. 3903 g.v. 17.8.)
III.
(aus Jnf. Lehr Rgt.)
II.
(früher II./92)
I.
12 12 12
6 12
IV.
schw.
640
6
4
12 4
30t

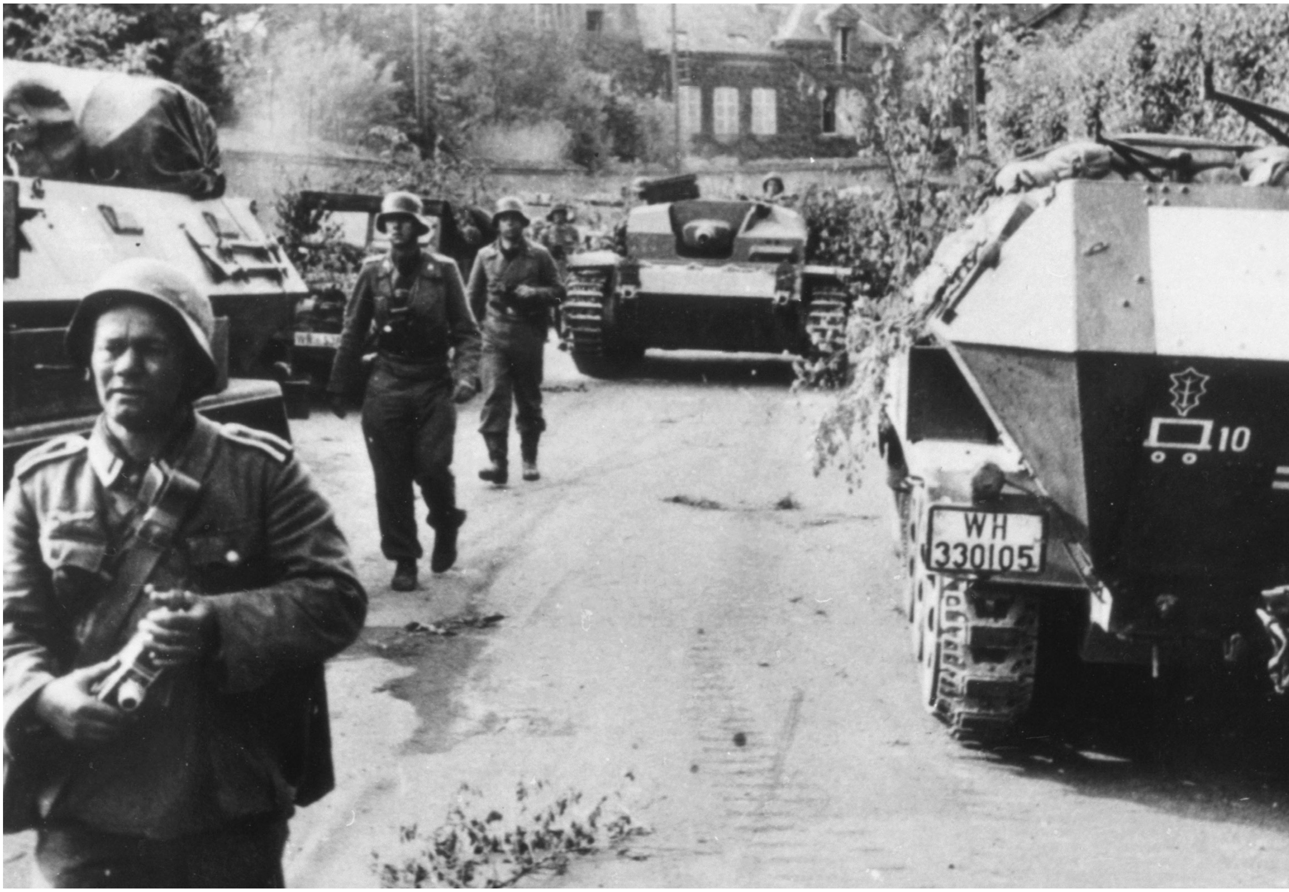
Establishment of *Sturmbatterie* 666 (planned for 20 May with combat readiness on 20 June) was delayed for a special reason. On 16 April, the commander-in-chief of the army ordered priority formation of an SS-*Sturmbatterie* for the SS-*Leibstandarte* division. Thus the last six *Sturmgeschütz* of the first production batch (Ausf A) scheduled to be delivered to *Sturmbatterie* 666 were retained for this new purpose.

The *Oberkommando des Heeres* (OKH) changed their orders, as noted in a document, dated 16 May 1940:

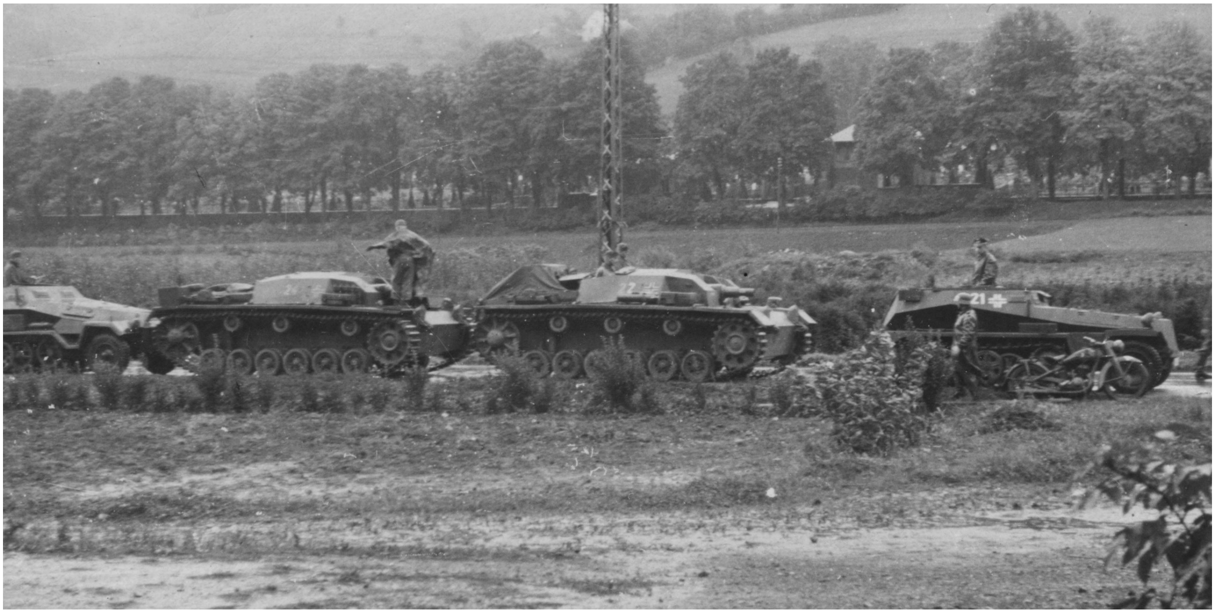
> *Sturmbatterie* 666
> Due to the vehicle situation, the date of establishment will be postponed. The exact date will be given by special order after resolving the vehicle situation.

Then on 18 May 1940:

> For *Sturmbatterie* 666 the date of establishment is ordered for 17 June 1940, with combat readiness on 17 July 1940. The *Sturmgeschütz* will be delivered by the end of June.



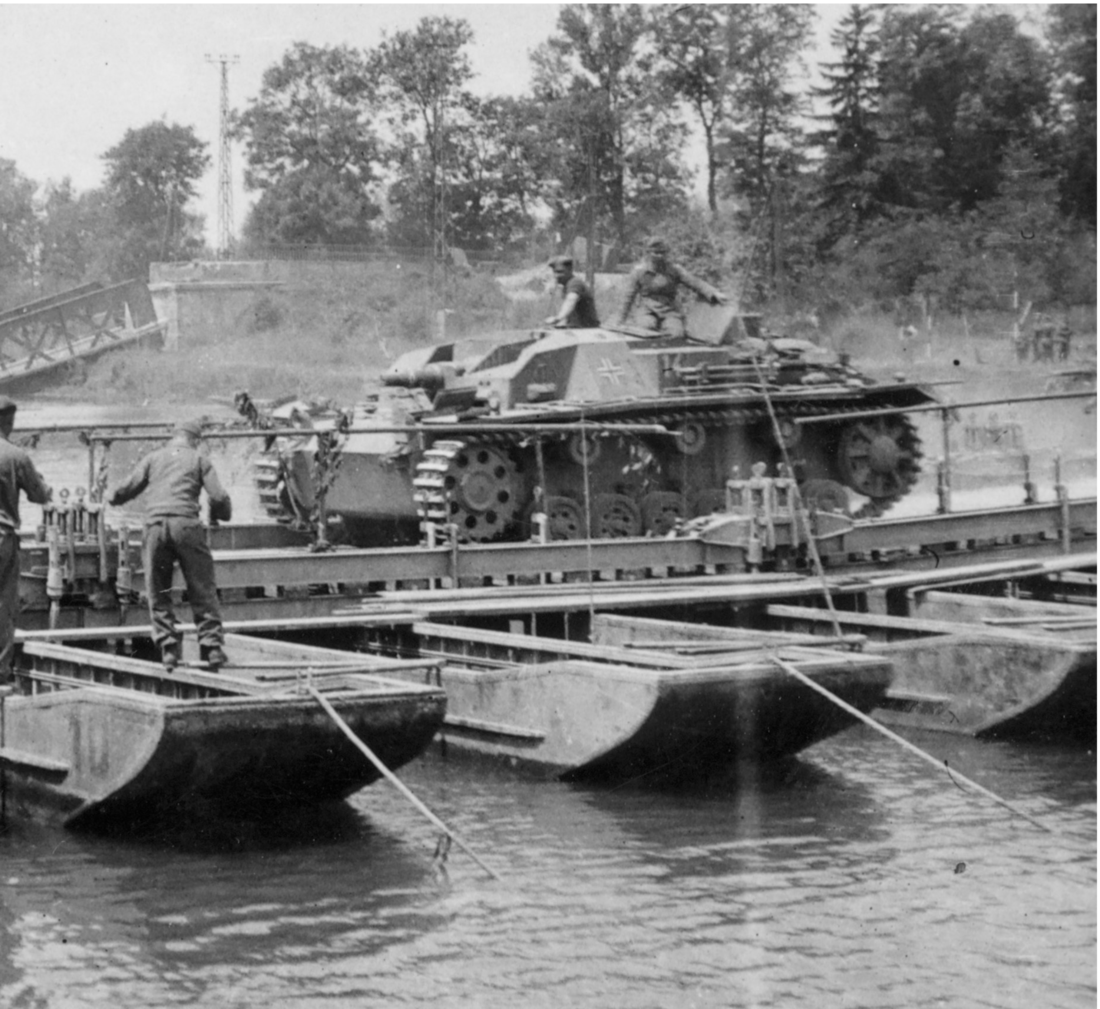
A *Sturmgeschütz* of *Sturmbatterie* 640 moves up among SdKfz 251/1s of *Infanterie-Regiment-Großdeutschland* (GD). In contrast to the vehicles used by some *Sturmbatterien*, those of StuBttr 640 were fabricated from armoured steel, as protection against shell splinters and armour-piercing rounds. (NARA)



Above: A platoon from *Sturmbatterie* 640 parked on a road in France, appears to have ignored combat orders by removing all protecting camouflage. The halftrack is a standard armoured SdKfz 251, possibly assigned from *Infanterie Regiment GD* to its StuG detachment. (Anderson)

To expedite replacements, Daimler-Benz was instructed to deliver six new *Sturmgeschütz* using PzKpfw III hulls from the Ausf F or G production line; superstructures and guns were not in short supply. Since these hulls had frontal armour of 30mm, it was decided to bolt an additional 20mm plate to the lower front plate to meet requirements. Apparently these six modified *Sturmgeschütz* were delivered to *Sturmbatterie* 666 in June 1940. However, when the unit was finally sent to France at end of July (the French campaign had ended), it is not known if the unit still had these modified *Sturmgeschütz* as no photographic evidence is available. Indeed, all photographs of the unit taken at this time show only the standard production *Sturmgeschütz* Ausf B.

Authors Kurowski and Tornau in their book *Sturmgeschütz – Die Panzer der Infanterie*, make note of a problem that concerned the bolts used to attach the 'add-on' 20mm armour. Allegedly, the holes for the mounting bolts had been drilled straight when they should have been tapered. They were not safe against a direct hit: a shorn-off bolt and the resulting steel splinters entering the fighting compartment could cause injury to the crew. Front-line *Sturmgeschütz* units considered the supply of these vehicles to be highly irresponsible.



Left: After this bridge had been destroyed by retreating French forces, German pioneer troops quickly assembled a pontoon bridge over the river. This allowed German forces, including this *Sturmgeschütz* Ausf A of *Sturmbatterie* 640 to cross and continue the advance. (Anderson)

Although this is plausible, the information came from a secondary source (possibly the recollections of a veteran) and cannot be authenticated or confirmed in any official documents.

Another source [Müller, Historyfacts] makes note of 20 such modified vehicles, his assumption being based on matching corresponding production and delivery statistics. There is only one photograph known of a destroyed modified *Sturmgeschütz*, possible evidence that some were sent to front-line units.

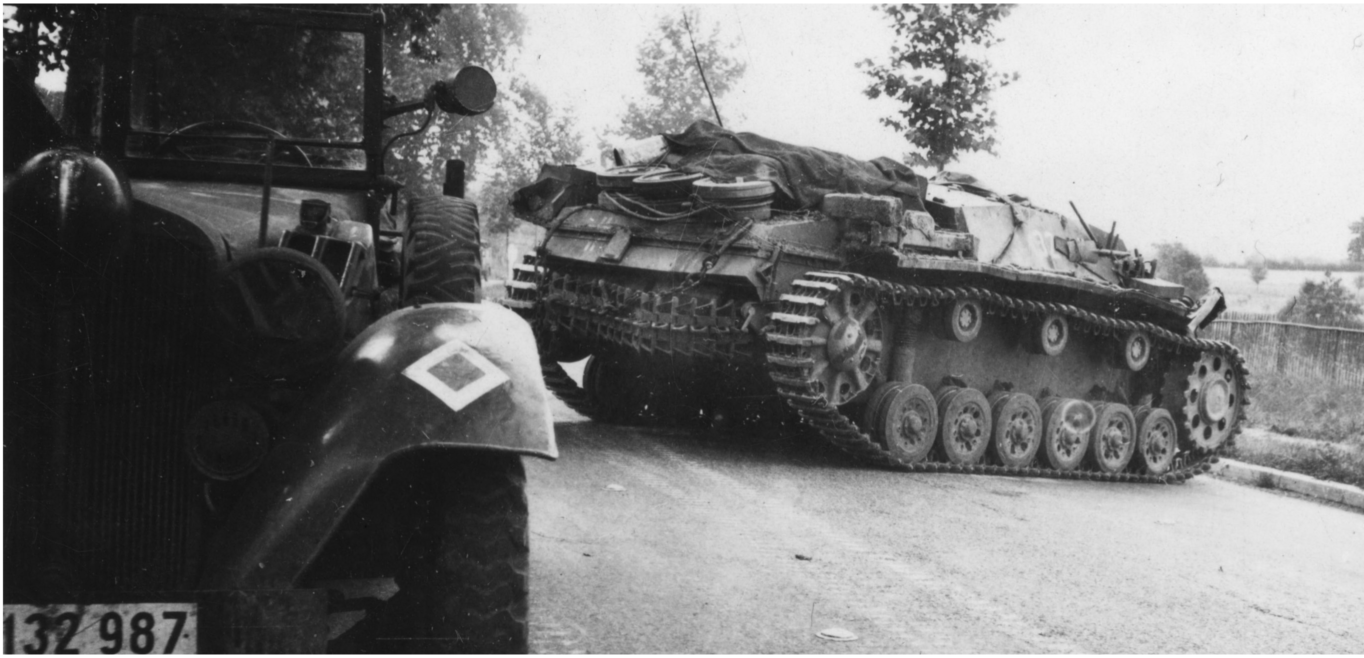
During the invasion of France, there were never more than 24 *Sturmgeschütz* in service with four *Sturmbatterien* (640, 659, 660 and 665) in combat. One vehicle was lost due to enemy action, but is reported to have been repaired in late 1940.

A First Assessment

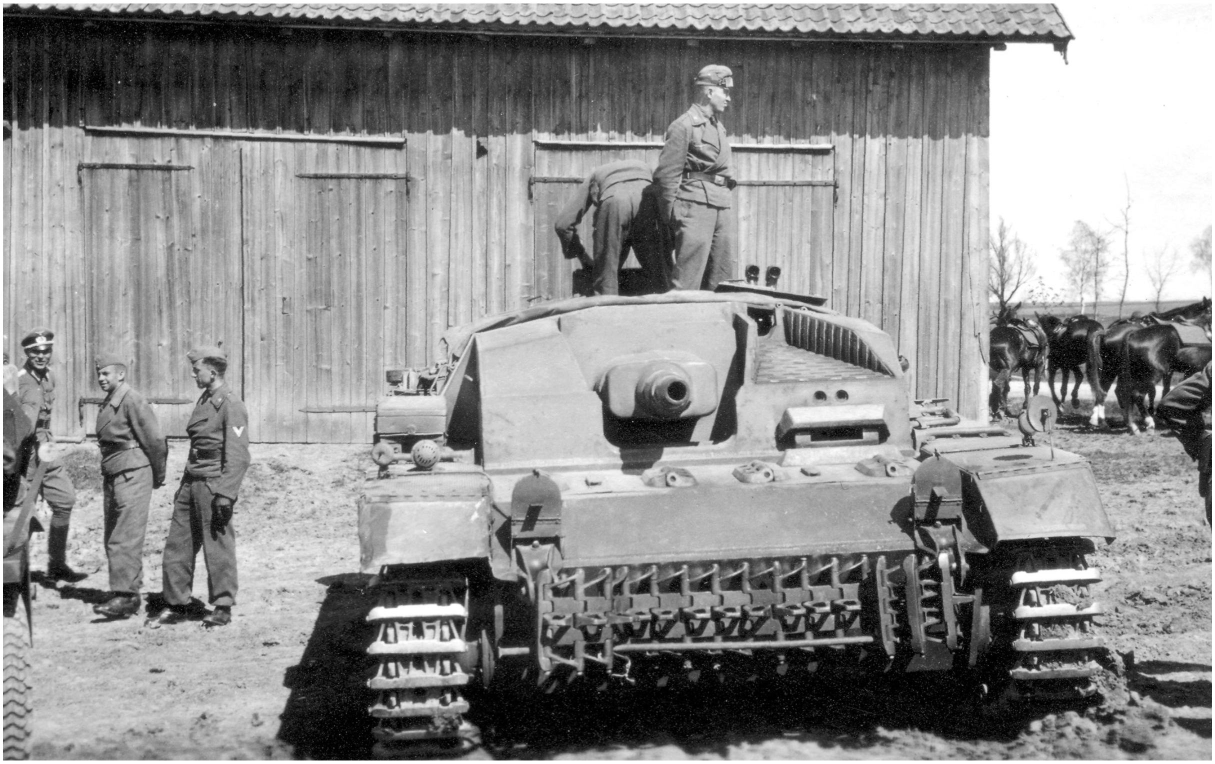
Due to the small number of *Sturmgeschütz* used in combat only few available (or found) after-action reports exist. Thus it is difficult, if not impossible, to assess this first deployment of the new weapon system. However, while the fighting in France was still in progress, the chief of army equipment noted in a letter to the ordnance department:

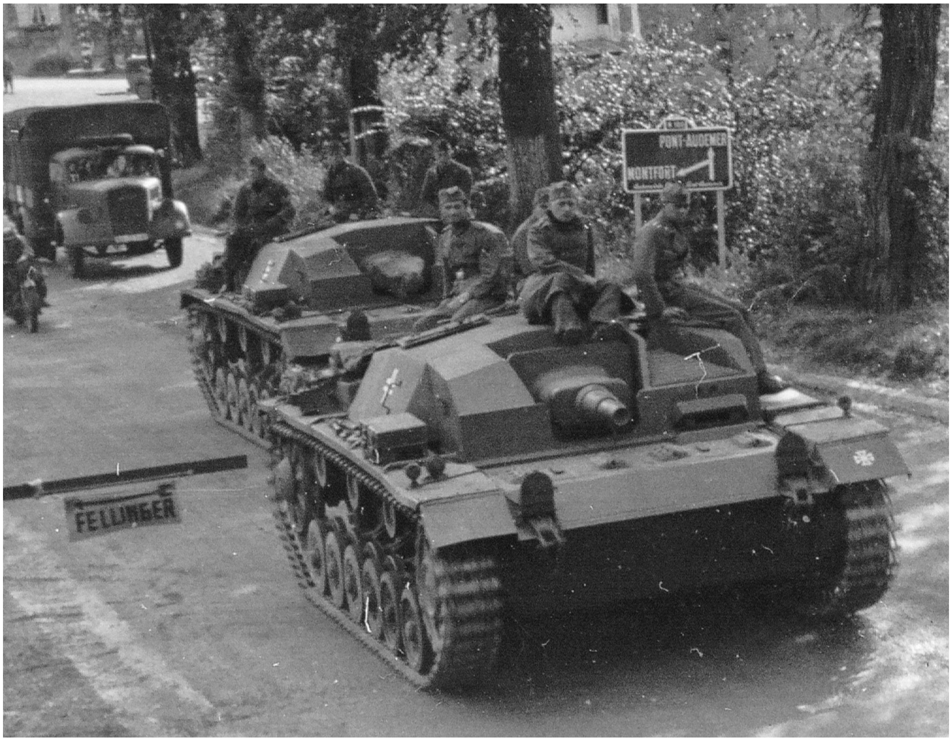
> The honorable commander in chief of the army places special emphasis on the increase of *Sturmgeschütz* output by all means exceeding the hitherto forecasts. We ask the ordnance department for their delivery of proposals.

Apparently the concept of an armoured support element for the infantry had been accepted.



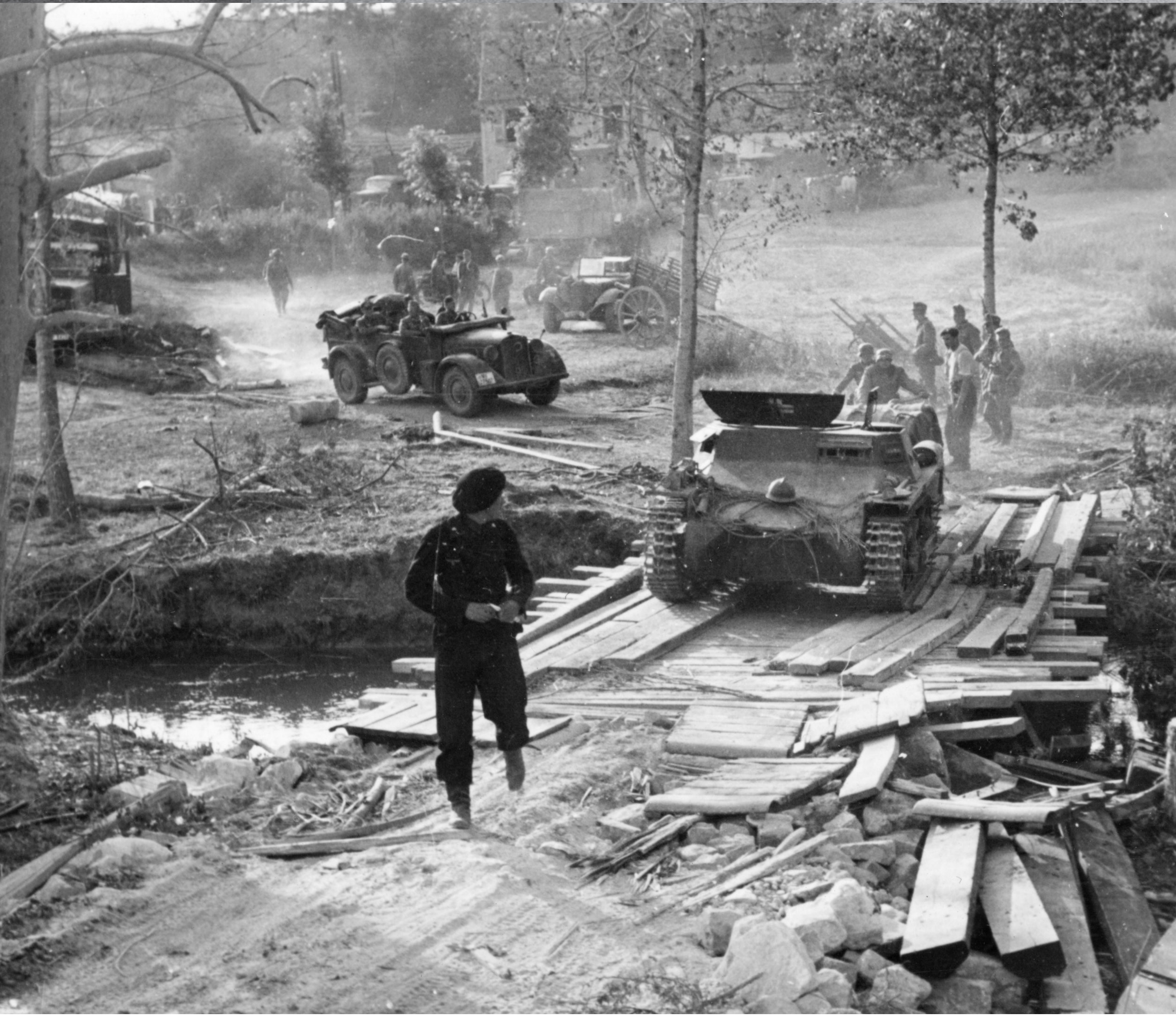
A *Sturmgeschütz* Ausf A, possibly from *Sturmbatterie* 640 (the two digit number is barely visible), has turned on the road to open fire against an observed target. The vehicle has damage to parts of the left-hand track guard; extra road wheels (along with the crew's personal belongings) are stacked on the engine cover. (Anderson)





Above: A *Sturmgeschütz* Ausf A of *Sturmbatterie* 665: Note the large aperture for the *Rundblickfernrohr* (RblF) gunsight. When the Ausf C entered service, this weak point was eliminated by the introduction of the *Selbstfahrlafette-Zielfernrohr* (Sfl-ZF) 1a gunsight. The deep grooving was designed to prevent bullets entering the crew compartment. (Anderson)

Left: A *Sturmgeschütz* of *Sturmbatterie* 660 moves up to the front line along on a French road. Note the prominent, but small, Iron Cross on the left-hand track guard. (Anderson)



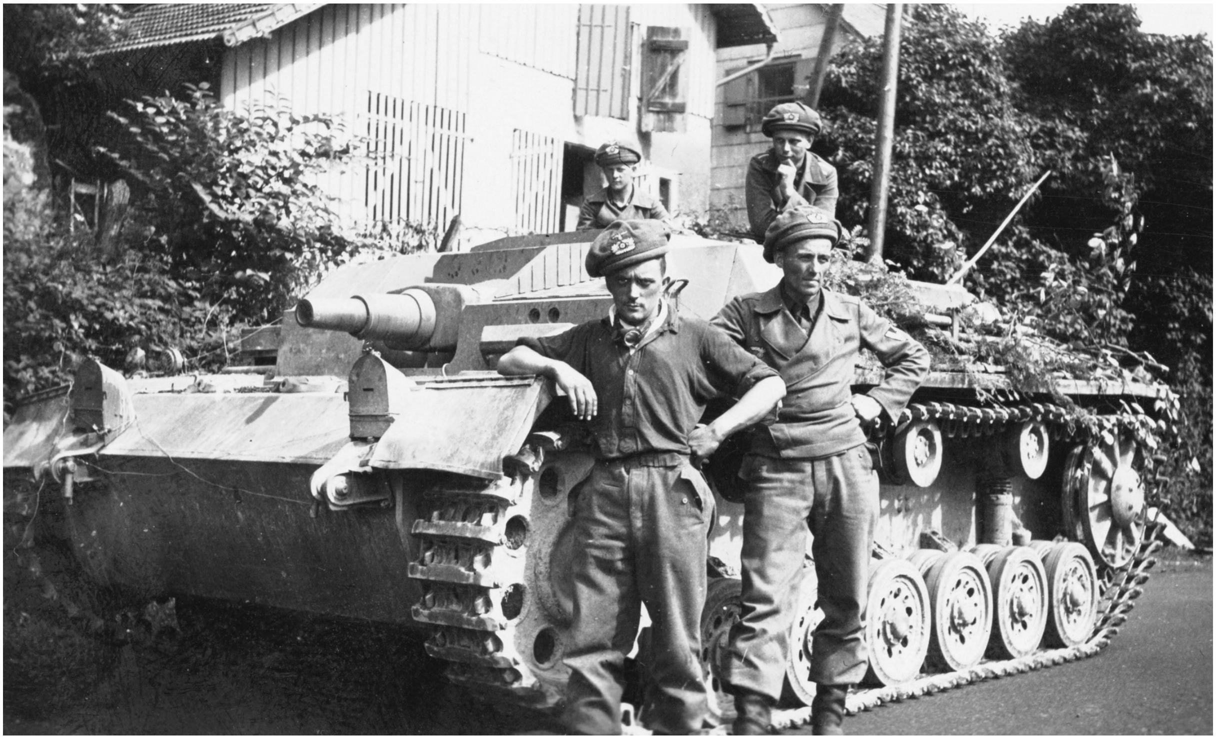
Due to a shortage of SdKfz 252 *Munitionswagen*, *Sturmbatterie* 660 received six *Munitionsschlepper*, built on the re-manufactured hull of a PzKpfw I Ausf A. The type was never popular as it proved to be mechanically unreliable. Note that the headlamp has been 'protected' by a French steel helmet. (Anderson)

Gefreiter (Private) H. Engel, a StuG driver in *Sturmbatterie* 660, recalled his experience of action in France:

> Our 7.5cm gun was fine... We had a choice between HE and AP rounds, and these could be used at any time. The French light tanks [Renault R35], were invulnerable to the 2cm guns of our light Panzers [PzKpfw II, author] but lost their turrets after direct hits from our '*Stummel*' (HE rounds fired from the short-barrelled 7.5cm gun)... We felt safe in our *Sturmgeschütz*, and an after-action check at Givry-en-Argonne showed that our front plate [25mm thick, author] had received 13 hits, but not one penetrated our armour.

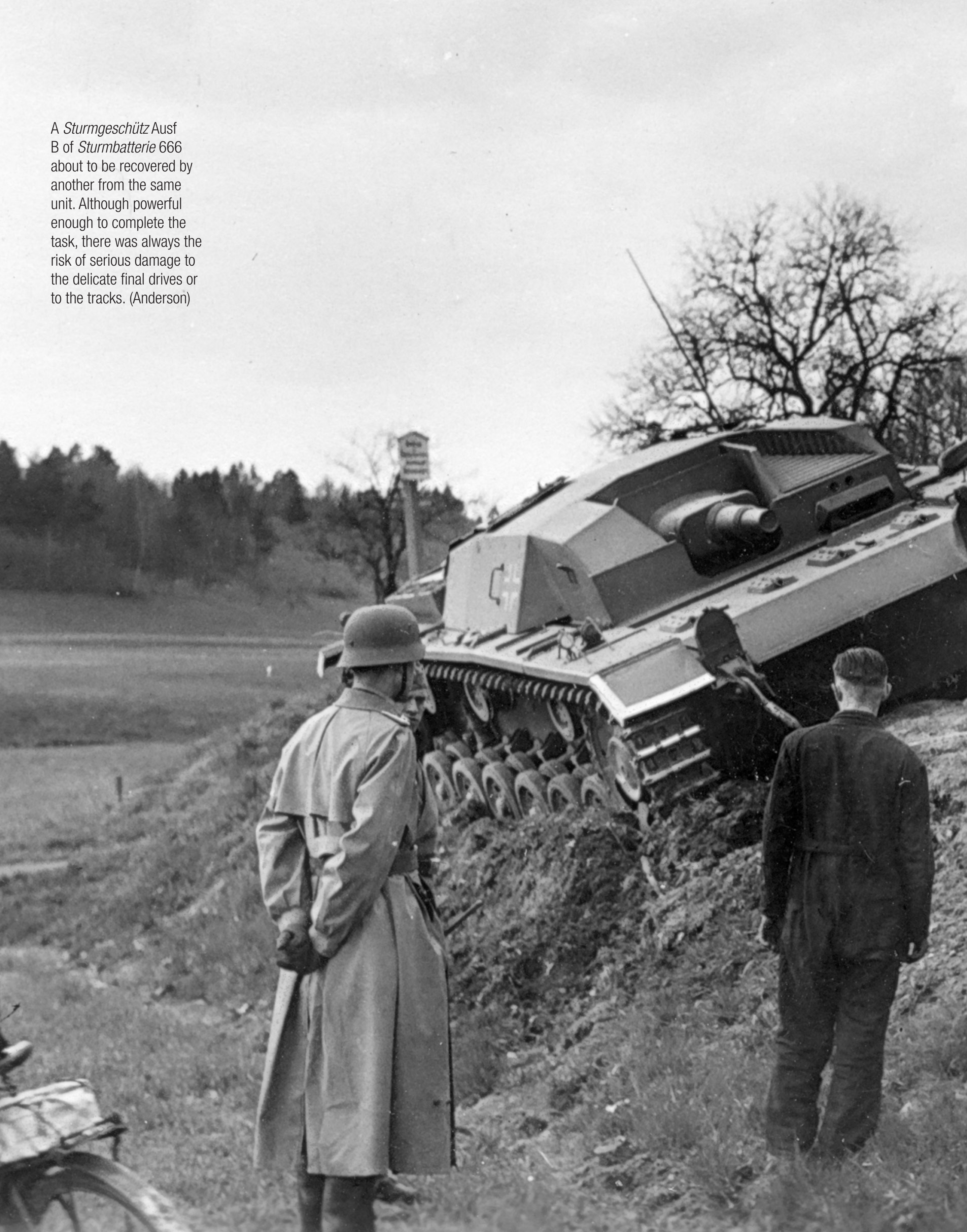
After the French campaign, German propaganda released a mission report from *Sturmbatterie* 640 to selected newspapers. Apparently this report found its way to military officials in the USA, from which they attempted make an evaluation of the unknown *Sturmgeschütz*:

> a.) All personnel for the 'Greater Germany' Infantry Regiment are specially selected. Initially, the bulk of men in this organization came from the Berlin guard regiment. The regiment is motorized and belongs to an SS Division.
>
> b.) The author [*sic*] indicates that in the particular engagement this assault artillery fulfilled the mission for which it was designated. Conversations with military personnel and in the context of other articles published in German military periodicals confirms the conclusion that this assault artillery gave important and timely assistance to the leading infantry elements on many occasions during operations on the Western Front in the spring of 1940.
>
> c.) Since this weapon is completely armoured, it conforms to the commonly accepted definition of a tank. According to published accounts, this weapon, during combat, moved forward from cover to cover, keeping generally aligned with the regimental reserve. When the advance of the leading infantry elements was checked by resistance beyond their capabilities, the armoured assault artillery was ordered forward along with other heavy infantry weapons and sometimes with the regimental infantry reserve. When going into action,



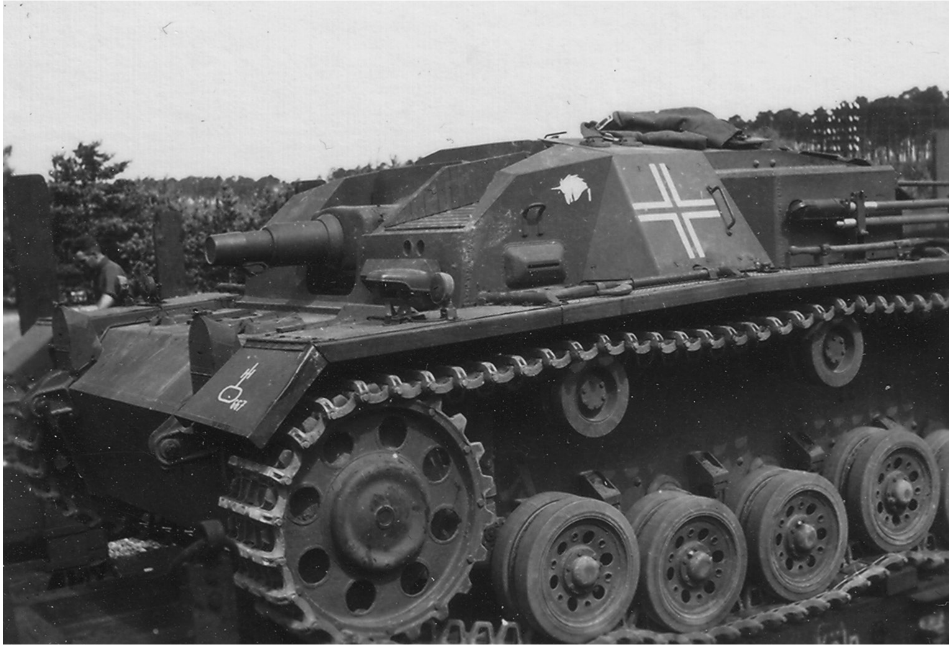
The crew of a *Sturmgeschütz* Ausf A from *Sturmbatterie* 665: All are wearing the distinctive tanker's beret which was lined with a hard material for extra protection. The vehicle is fitted with narrow 38cm tracks, but all the running wheels have already been replaced with those designed for the 40cm track. (Münch)

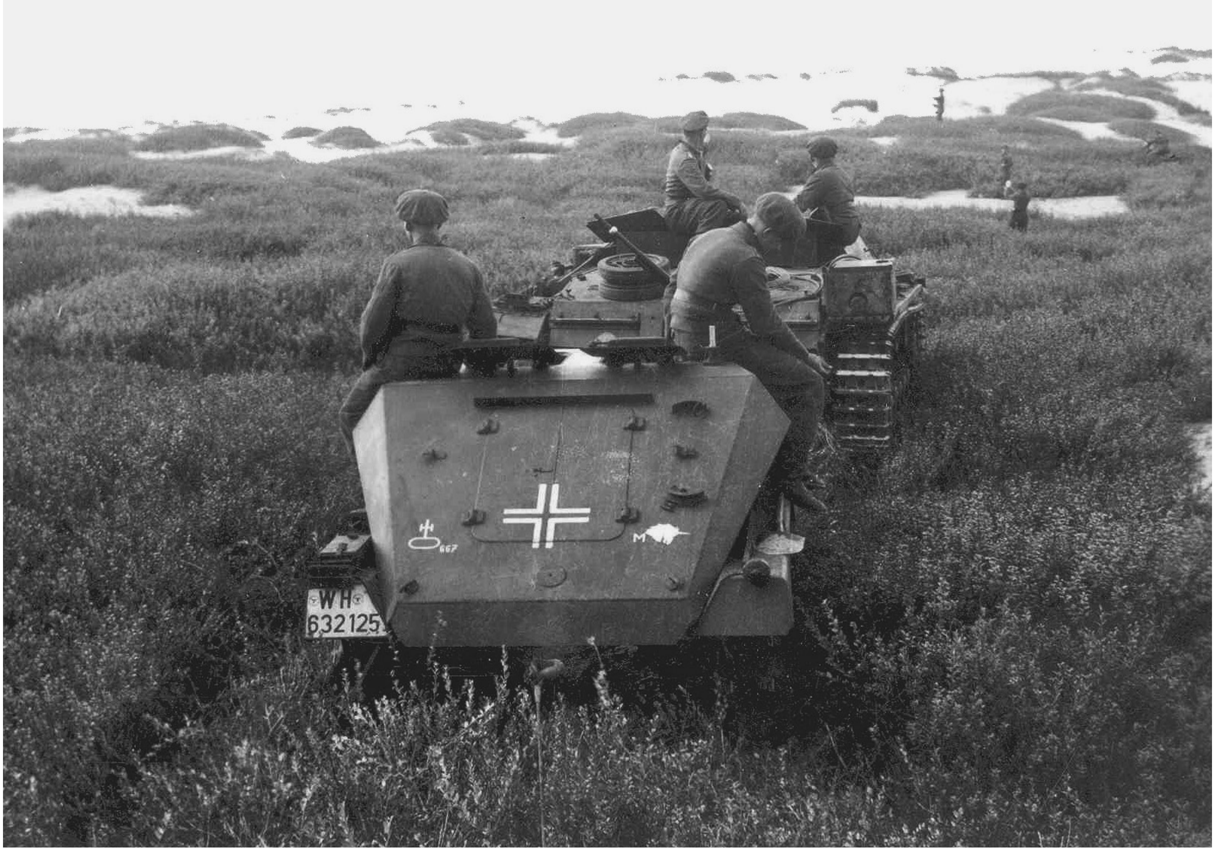
A *Sturmgeschütz* Ausf B of *Sturmbatterie* 666 about to be recovered by another from the same unit. Although powerful enough to complete the task, there was always the risk of serious damage to the delicate final drives or to the tracks. (Anderson)



Right: *Sturmbatterie* 667 used a rearing Unicorn as its unit emblem. Even after being expanded to a battalion, the unit retained the same emblem until end of the war. The vehicle carries the numeral 1 and the tactical symbol for *Sturmgeschütz*. (Anderson)

Below: After France had capitulated, many German units became involved in preparations and training for Operation *Sealion*: Hitler's planned landings in southern England. An SdKfz 252 of *Sturmbatterie* 667 follows a *Sturmgeschütz* over the sand dunes near the Channel coast. (Anderson)



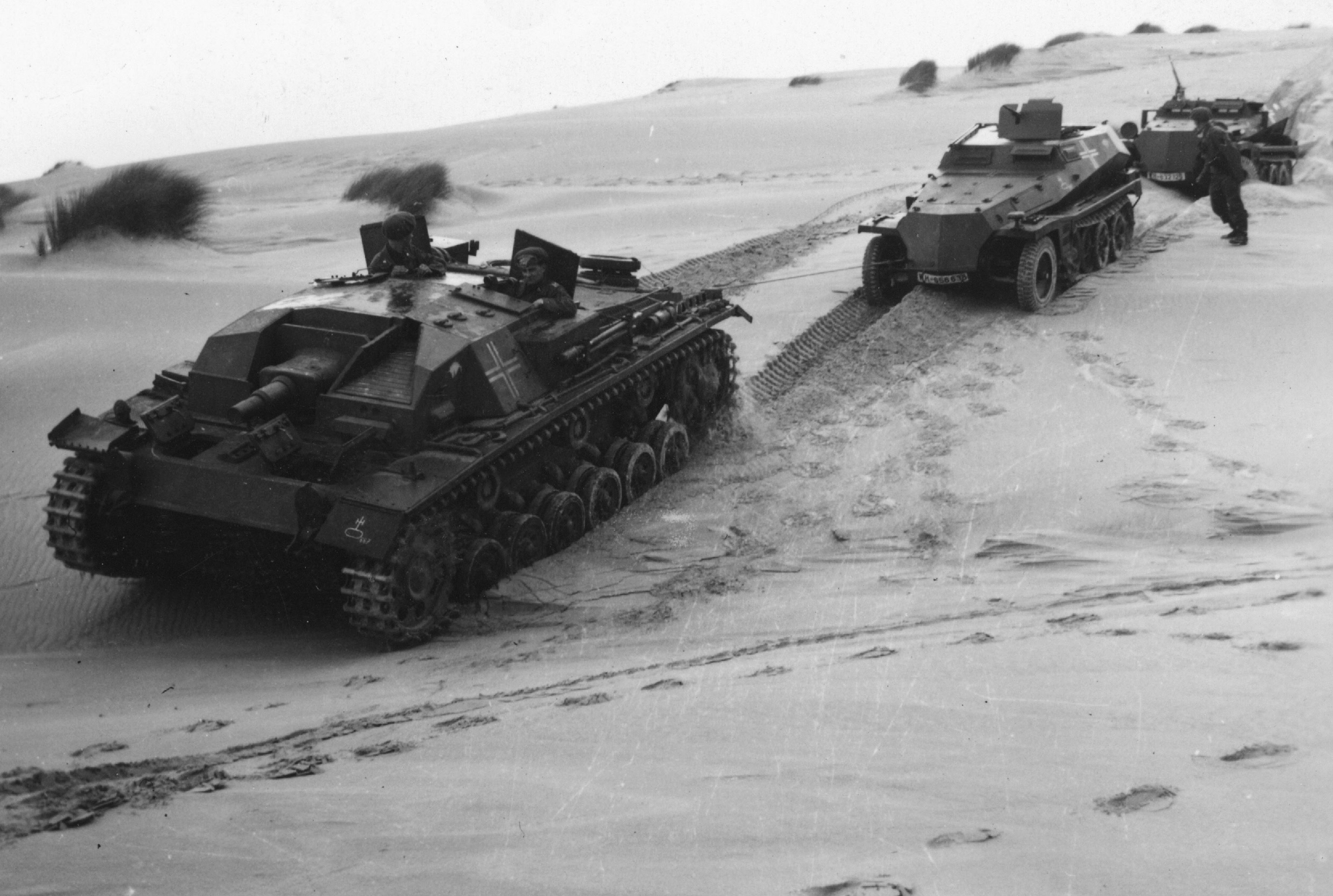


armoured assault artillery vehicles sought suitable covered positions in the front line, from which they delivered direct fire upon observed targets. It is not believed that they ever preceded and cleared the way for the infantry elements. Consequently, these weapons, as employed, are not comparable to accompanying tanks.

d.) It is probable that if the defending French forces had been sufficiently equipped with anti-tank mines and anti-tank weapons, they could have neutralized the efforts of the German armoured assault artillery.

e.) The action east of Suxy [Belgium] is in accordance with the German principle that attacking infantry seeks primarily to seize commanding terrain, not only for observation and the deployment of infantry weapons, but also for the advantageous use of artillery.

f.) It is noted that in the attack east of Suxy, the commander of the 1st Battalion saved time by merely signalling his instructions to the commander of his reserve company for him to turn off his route of advance and attack in a new direction. Details of the action contemplated for this company could be confirmed later by the battalion commander or his representative.



The cross-country capability (especially in deep sand) of the light halftrack vehicles proved to be very poor. It is interesting to note that the SdKfz 253 has a traversable machine gun, with a protective armour shield, mounted to the commander´s hatch. The SdKfz 252 in the background also mounts a machine gun. (Anderson)

A document published by the OKH, dated 27 January 1941, reveals a simple and concise evaluation of the *Sturmgeschütz*:

> An analysis of the experience gained by the artillery in the west:
>
> Despite their actual true purpose, *Sturmgeschütz* were often used as tanks well ahead of the infantry. This commitment is wrong. By doing so, *Sturmgeschütz* will have the value of solely fighting as stand-in tanks, which for certain will be attacked from the flanks by the enemy´s anti-tank defences. In contrast, *Sturmgeschütz* were often used with success in overpowering bunkers and other strongpoints.

Left: A single *Sturmgeschütz* was often used for a reconnaissance mission as its low profile made it easier to conceal and the strong frontal armour protected the crew if attacked by enemy anti-tank infantry. (von Aufseß)

In a similar document dealing with the tactical experiences of the infantry during *Fall Gelb*, no further notes for the *Sturmgeschütz* can be found: possibly a hint as to the low number of the type being used in action.

Defining the Concept

Due to the very specific tactical demands, the intended commitment of the *Sturmgeschütz* was different from that of the German Panzer.

The *Sturmgeschütz* was to accompany the advancing infantry and should only be used against targets selected by the battery leader, who was subordinate to the infantry commander. Combat in platoon or battery strength was standard practice. An isolated action by a lone *Sturmgeschütz* proved to be ineffective as the type was not designed for such a mission.

Following an old artillery tradition, the platoon leader of a *Sturmgeschütz* battery was a forward observer. He and his observation troop would reconnoitre the battlefield before and during the assault in an SdKfz 253 armoured halftrack vehicle. His troop of observers would dismount from the vehicle to perform their duties.

In combat, the *Sturmgeschütz* battery or platoon would be operating far ahead of its supply elements. For this reason an armoured ammunition carrier (SdKfz 252) was issued every platoon, making it possible to transport ammunition and fuel under battlefield conditions to the *Sturmgeschütz* in their forward positions.

Although only a small number of *Sturmgeschütz* were deployed during the invasion of France, they were to play a major role in forthcoming operations.

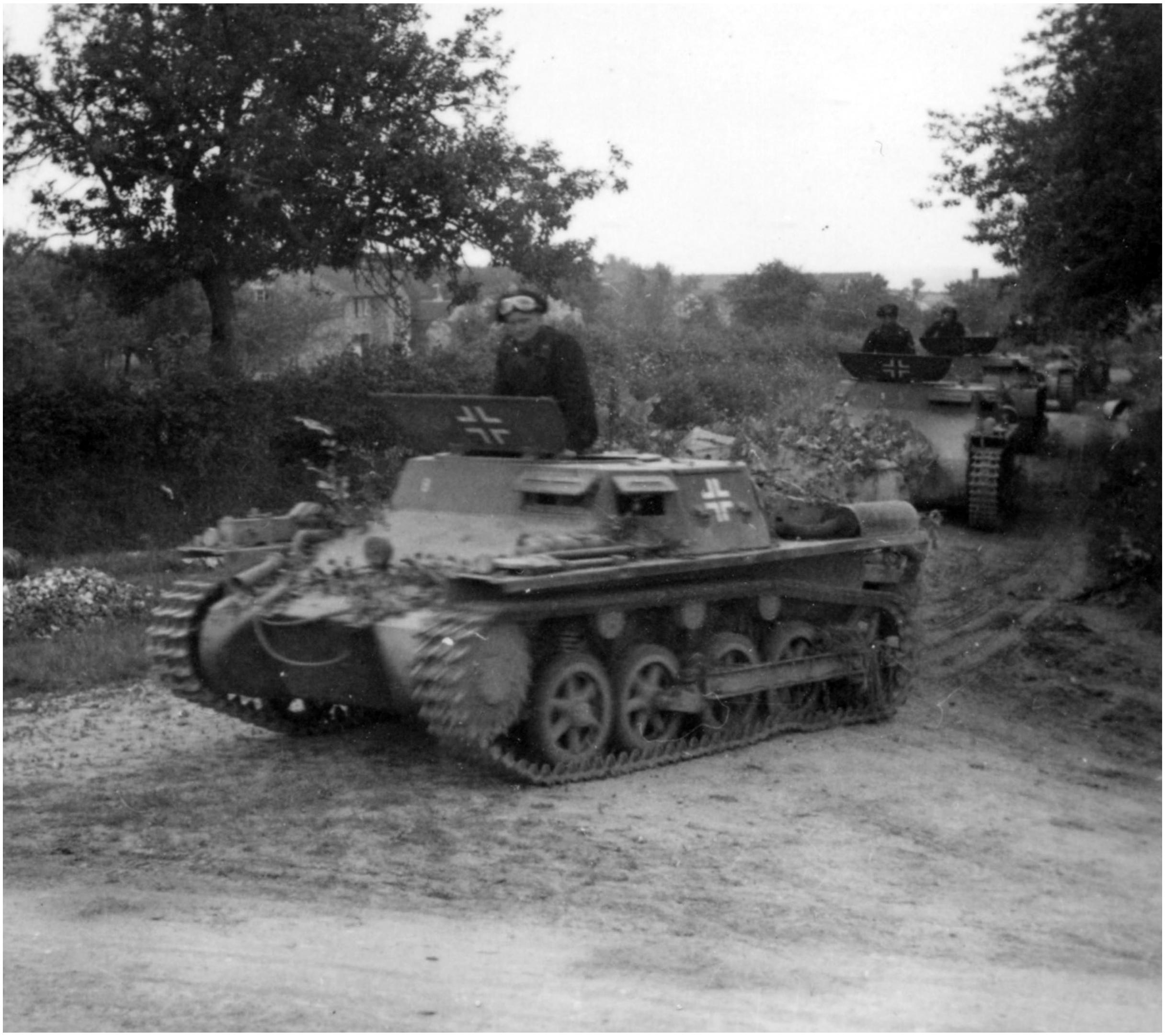
In August 1940, a preliminary document (HDv 200/2m, manual for the artillery, preliminary training instructions for the *Sturmbatterie*) was published by the *Artillerie-Lehr-Regiment*:

> Overview
>
> 1.) The *Sturmgeschütz* is an attack weapon… The *Sturmbatterie* fights within the scope of the battery, and if necessary, of the platoon… Furthermore, the *Sturmbatterie* should be used wherever the infantry or *Panzertruppe* will meet strongest resistance.

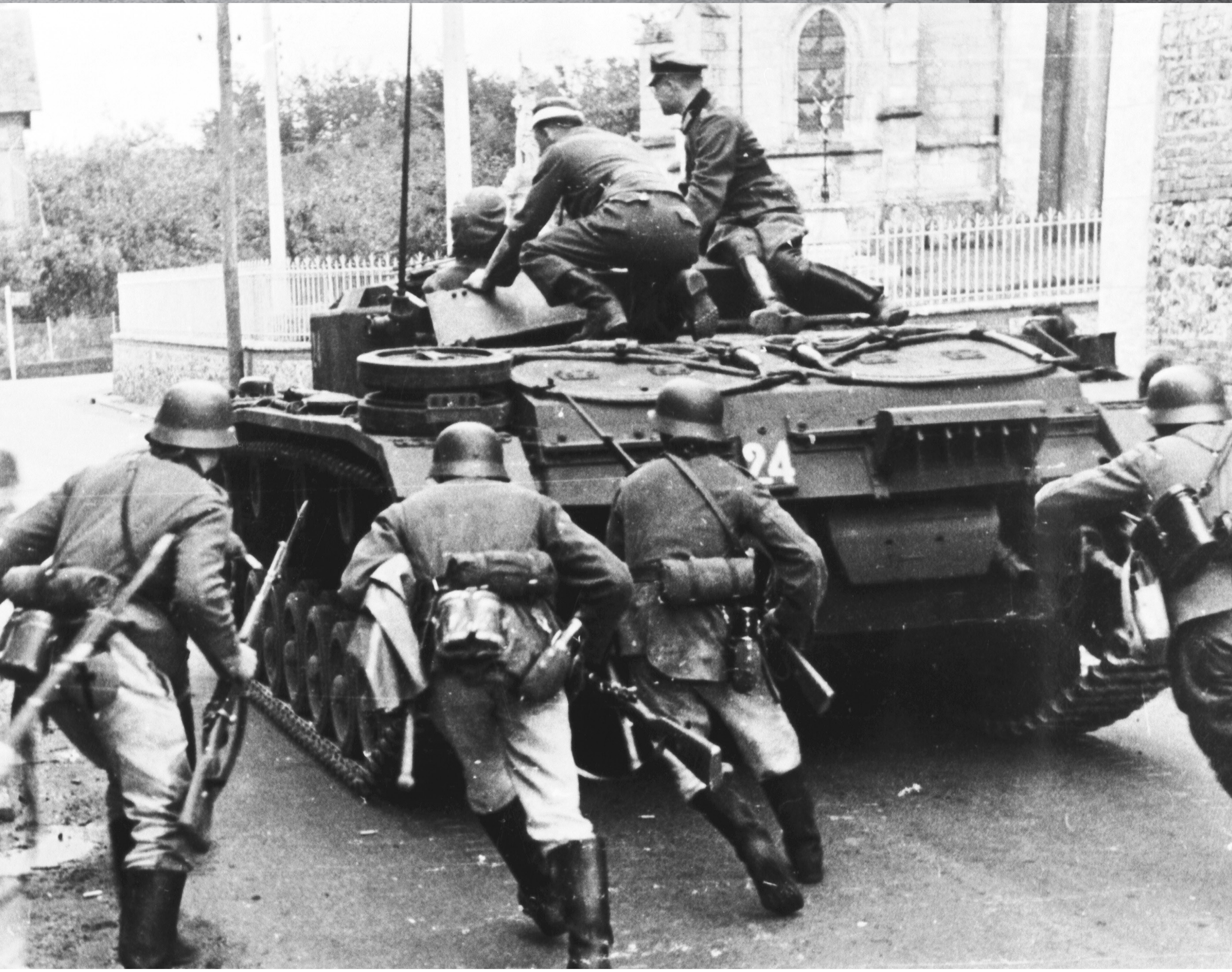
2.) The main objective of the *Sturmgeschütz* is to destroy enemy infantry guns and anti-tank guns.
3.) Their deployment within the structure of the divisional artillery will be the exception. A swift transition from this task to the main mission has to be ensured at all times.

III.) Principles for tactical deployment:

A.) General remarks
57.) For the accomplishment of specific missions the *Sturmgeschütz-Abteilung* will be subordinated to a division.
60.) In order to assist the infantry, the *Sturmartillerie* is to combat heavy enemy weapons which cannot be quickly defeated by other elements. When assisting



A *Munitionsschlepper* I of *Sturmbatterie* 660: The type was built on the chassis of the PzKpfw I Ausf A, by removing the turret and fitting a top plate with a simple two-part hatch. The vehicle was designed for the supply of ammunition, under armour protection, to *Sturmgeschütz* at the battlefront. (Anderson)



After the conclusion of the French campaign, all units remaining in the country continued to practise military tactics in numerous exercises.
A *Sturmgeschütz* of StuGAbt 184 provides cover for following infantry as it moves through a small town. A supervising officer (umpire) wearing a white band around his beret is sitting on top of the vehicle. (Münch)

a tank unit in the assault, the *Sturmartillerie* takes over tasks of the Panzer IV and combats any enemy anti-tank guns positioned at the front.

62.) The *Sturmgeschütz* shall not be deployed as *Panzerjäger* (tank destroyer). Enemy tanks will be attacked only in self-defence.

B.) Tactical deployment:

66.) Normally the *Sturmgeschütz-Abteilung* will be divided within the infantry regiment's battery. Ony for special cases (establishment of a point for the main assault) will it be necessary to subordinate the entire *Abteilung* under an infantry regiment.

71.) Counterattacks by enemy tanks will be engaged at first by our own *Panzerjäger* troops. The *Sturmgeschütz-Abteilung* will combat the enemy's heavy weapons. Only if the *Panzerjäger* are not successful will the *Sturmgeschütz* fight the enemy tanks.

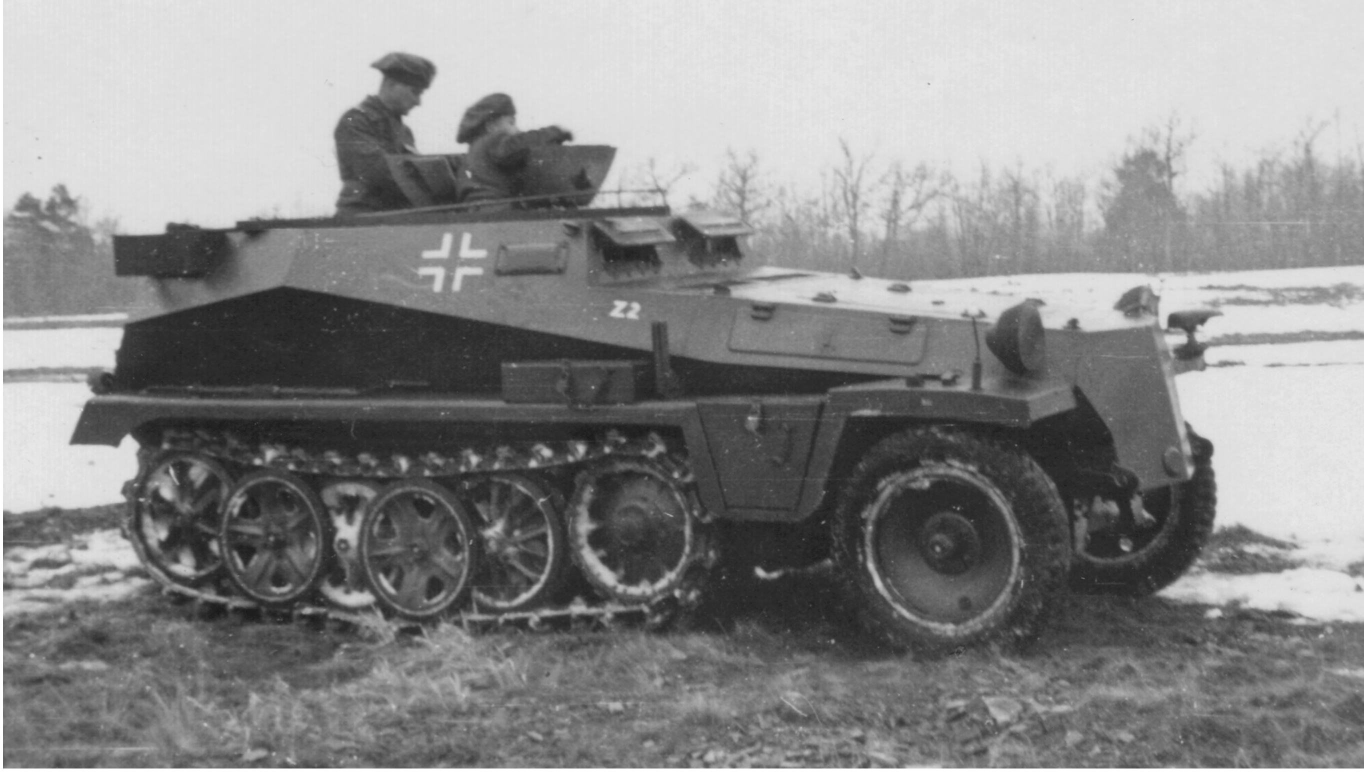
77.) In order to assist the infantry during a withdrawal, an entire battery, a platoon or even single a *Sturmgeschütz* can be ordered to support. Thanks to their armour, *Sturmgeschütz* can fight objectives without infantry support.
80.) Within the frame of a *Panzerdivision*, the following tasks can be undertaken:

a.) Support the *Panzerdivisions* attack by overpowering enemy anti-tank weapons.
b.) Escorting further tank attacks by fighting enemy anti-tank defences.
c.) Escorting the attack of the rifle regiment.

The ALR was, among other things, responsible for the continuous development for the tactical usage of the *Sturmgeschütz*. In 1941, an instructional guide for the deployment of the smallest *Sturmartillerie* unit, the *Sturmzug* (assault platoon) equipped with two *Sturmgeschütz*, was published:

The subordinated *Sturmzug*:

Following the advance by the infantry to 800m to 1,500m from the main line of resistance, the time has come to call upon the *Sturmzug*. The battalion commander will give a direct order to the platoon leader, who will later get more exact information from the leader of the infantry company.
At that time all preparations have been made so that the *Sturmzug* is ready for action when order for combat is given.



At the end of 1940, StuGAbt 197 was established at Jüterbog and training began immediately then continued until the unit was transferred to Brieg, Silesia, in January 1941. The SdKfz 253 *Führerwagen* has the markings of 2.*Zug* and carries a crew of four. The *Zugführer* (platoon leader) is in the larger hatch, and his *Funker* (wireless operator) is in the rear hatch. (Anderson)

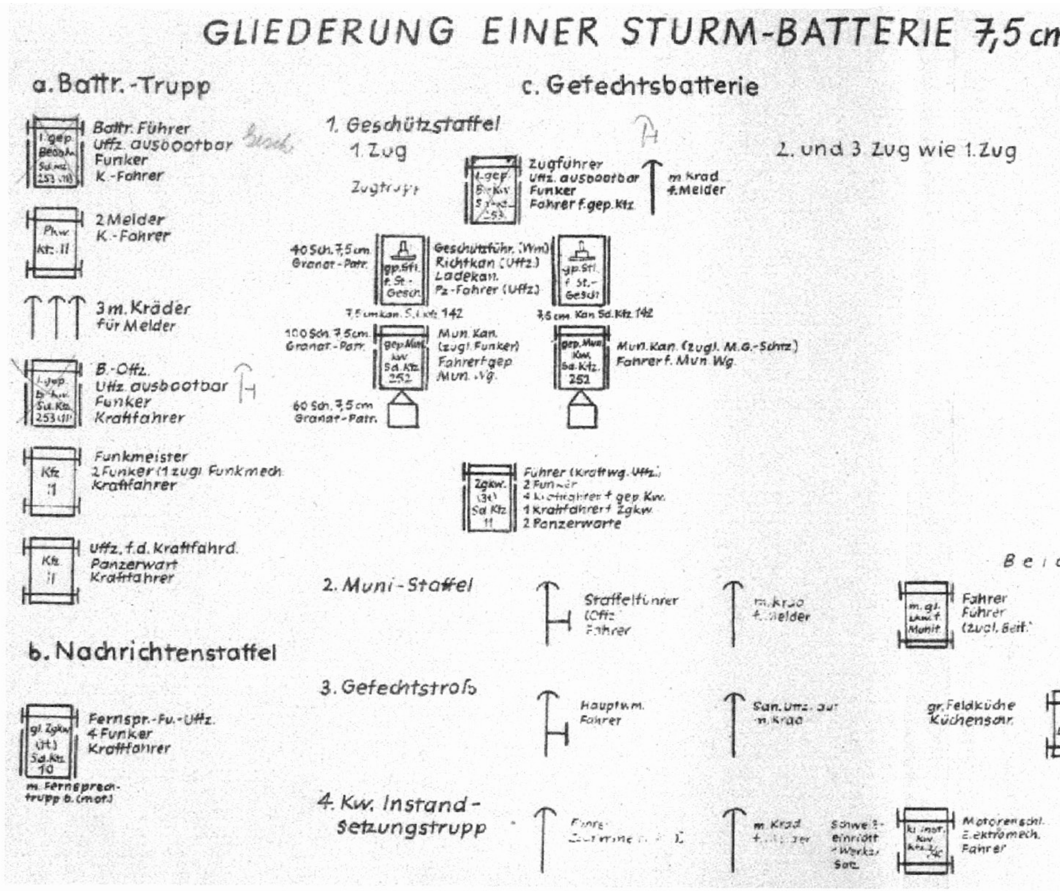
A *Sturmgeschütz* Ausf B of StuGAbt 197, carefully conceal in a snow-covered pine wood, during one of the many exercises which took place in preparation for the coming campaigns of 1941. (Von Aufseß)

Tasks of the platoon leader:
1.) Making contact with the company leader of the infantry.
2.) Briefing of the *Sturmgeschütz* leaders in the field.
3.) Target designation...
6.) Combat report to the battery leader.

Tasks of the *Sturmgeschütz* leader:
1.) Replenishing the ammunition (without special order).
2.) Reconnaissance for a suitable approach to the objective.
3.) Order to the *Munitionswagen*. This vehicle must always be in visual contact with the *Sturmgeschütz*.

Choice of the assembly position:
1.) Cover against surface and air observation.
2.) Selected approach route.
3.) Assembly position must in no instance be ahead of our own infantry. The position must be always secured by infantry...
6.) Firm ground conditions are important, extreme care should be taken over swampy terrain.

Sturmbatterie Table of organization integrated in a *Sturmgeschützabteilung* a

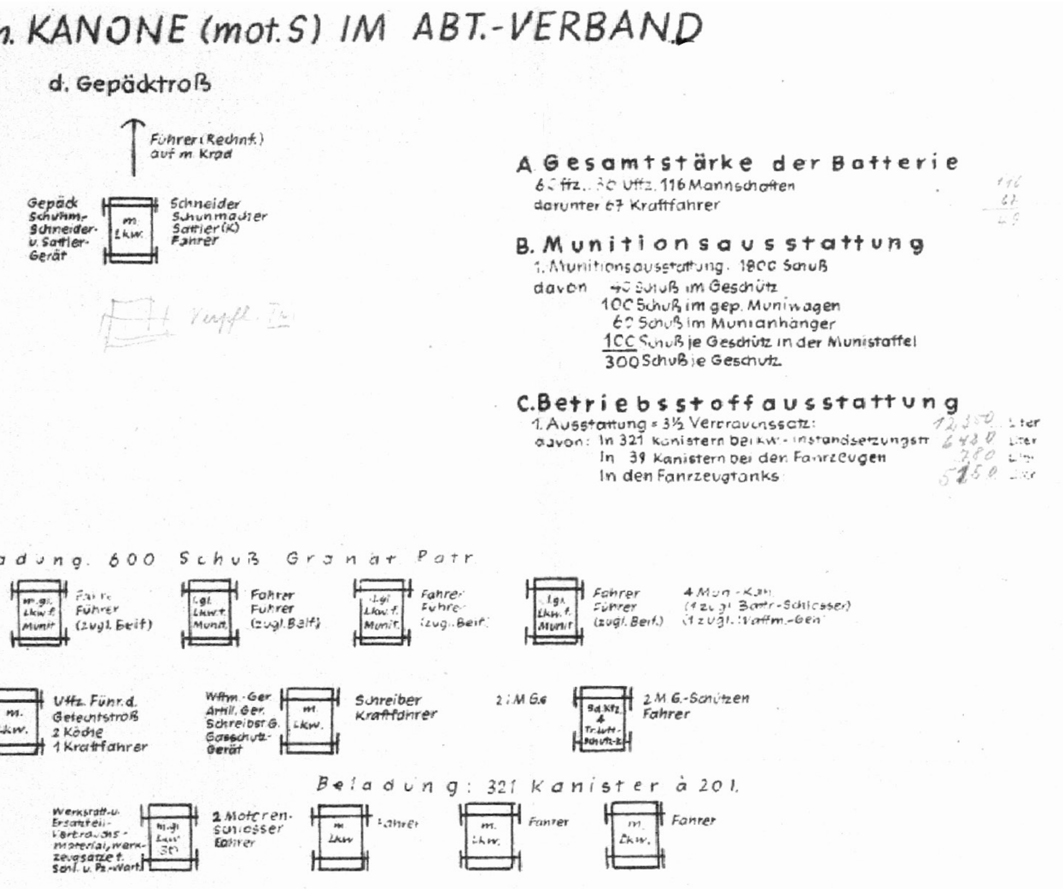

GLIEDERUNG EINER STURM-BATTERIE 7,5 cm
a. Battr.-Trupp
1. gep. Beob. Kw. Sd. Kfz. 253 (11)
Battr. Führer
Uffz. ausbootbar
Funker
K.-Fahrer
Pkw. Kfz. 11
2 Melder
K.-Fahrer
3 m. Kräder für Melder
1. gep. B. Kw. Sd. Kfz. 253 (11)
B.-Offz.
Uffz. ausbootbar
Funker
Kraftfahrer
Kfz. 11
Funkmeister
2 Funker (1 zugl. Funkmech.
Kraftfahrer
Kfz. 11
Uffz. f. d. Kraftfahrd.
Panzerwart
Kraftfahrer
b. Nachrichtenstaffel
gl. Zgkw. (1t) Sd. Kfz. 10
Fernspr.-Fu.-Uffz.
4 Funker
Kraftfahrer
m. Fernsprechtrupp b. (mot.)
c. Gefechtsbatterie
1. Geschützstaffel
1. Zug
Zugtrupp
2. und 3 Zug wie 1. Zug
1. gep. B. Kw. Sd. Kfz. 253
Zugführer
Uffz. ausbootbar
Funker
Fahrer f. gep. Kfz.
m. Krad f. Melder
40 Sch. 7,5 cm Granat-Patr.
gp. Sfl. f. St.-Gesch.
Geschützführ. (Wm)
Richtkan. (Uffz.)
Ladekan.
Pz-Fahrer (Uffz.)
7,5 cm Kan. Sd. Kfz. 142
100 Sch. 7,5 cm Granat-Patr.
gep. Mun. Kw. Sd. Kfz. 252
Mun. Kan. (zugl. Funker)
Fahrer f. gep. Mun. Wg.
60 Sch. 7,5 cm Granat-Patr.
gep. Mun. Kw. Sd. Kfz. 251
Mun. Kan. (zugl. M.G.-Schtz.)
Fahrer f. Mun. Wg.
Zgkw. (3t) Sd. Kfz. 11
Führer (Kraftwg. Uffz.)
2 Funker
4 Kraftfahrer f. gep. Kw.
1 Kraftfahrer f. Zgkw.
2 Panzerwarte
2. Muni-Staffel
Staffelführer (Offz.
Fahrer
m. Krad f. Melder
m. gl. Lkw. f. Munit.
Fahrer
Führer (zugl. Beif.)
3. Gefechtstroß
Hauptw.m.
Fahrer
San. Uffz. auf m. Krad
gr. Feldküche
Küchenuffz.
4. Kw. Instandsetzungstrupp
m. Krad f. Melder
Schweißeinricht. Werkz. Satz
kl. Inst. Kw. Kfz. 2/40
Motorenschl.
Elektromech.
Fahrer
Bei

Here is a first hint of the limited survivability of the *Sturmgeschütz*: if deployed for a solo attack or if it became isolated, the turretless vehicle was fitted with limited vision devices and did not have close-defence weapons. Also, they were dependent on protection by infantry forces when in assembly or jump-off positions. This fact was fully acknowledged by the ALR, as their manuals repeatedly mention the importance of infantry support. While this was of minor importance during the initial phase of the war, it quickly became a vital pre-requisite after the attack on Russia.

Reorganization after France

Due to the slow start of *Sturmgeschütz* production, the building up of field units took place at a respectively slow pace. Instead of issuing *Abteilungen* of three batteries each to selected infantry divisions, it was decided to prioritise the establishment of independent batteries.

ccording to KStN 446, dated 8 July 1940


n. KANONE (mot.S) IM ABT.-VERBAND
d. Gepäcktroß
Führer (Rechnf.) auf m. Krad
Gepäck Schuhm.- Schneider- u. Sattler- Gerät
m. Lkw.
Schneider Schuhmacher Sattler (K) Fahrer
adung. 600 Schuß Granat Patr.
m.gl. Lkw. f. Munit
Fahrer Führer (zugl. Beif)
l.gl. Lkw. f. Munit.
Fahrer Führer (zugl. Beif.)
l.gl. Lkw. f. Munit.
Fahrer Führer (zugl. Beif.)
l.gl. Lkw. f. Munit
Fahrer Führer (zugl. Beif.)
4 Mun.-Kan. (1 zugl. Battr.-Schlosser) (1 zugl. Waffm.-Geh.)
m. Lkw.
Uffz. Führ. d. Gefechtstroß 2 Köche 1 Kraftfahrer
Wffm.-Ger. Artill. Ger. Schreibst. G. Gasschutz- Gerät
m. Lkw.
Schreiber Kraftfahrer
2 l. M.G. 34
Sd.Kfz. 4 Tr.Luft-Schutz-K.
2 M.G.-Schützen Fahrer
Beladung: 321 Kanister à 20 l.
Werkstatt-u. Ersatzteil- Verbrauchs- material, Werk- zeugsätze f. Schl. u. Pz.-Wart.
m.gl. Lkw 3t
2 Motoren- schlosser Fahrer
m. Lkw
Fahrer
m. Lkw.
Fahrer
m. Lkw.
Fahrer

A. Gesamtstärke der Batterie

6 Offz., 30 Uffz. 116 Mannschaften
darunter 67 Kraftfahrer

116
67
49

B. Munitionsausstattung

1. Munitionsausstattung: 1800 Schuß
davon 40 Schuß im Geschütz
100 Schuß im gep. Muniwagen
60 Schuß im Munianhänger
100 Schuß je Geschütz in der Munistaffel
300 Schuß je Geschütz.

C. Betriebsstoffausstattung

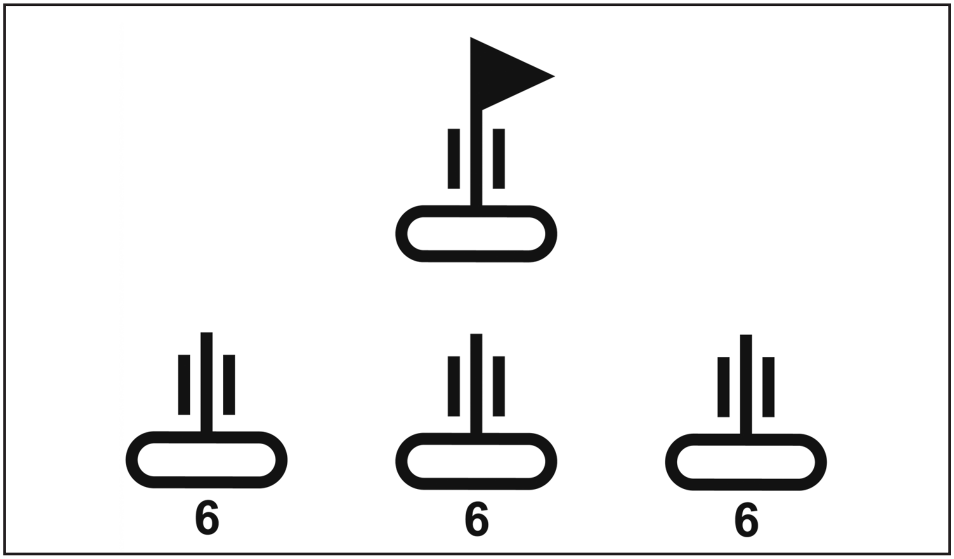
1. Ausstattung = 3½ Verbrauchssatz: 12.350 Liter
davon: In 321 Kanistern bei Kw.-Instandsetzungstr. 6480 Liter
In 39 Kanistern bei den Fahrzeugen 780 Liter
In den Fahrzeugtanks 5150 Liter

After the successful French campaign, the establishment of full-scale *Sturmgeschütz-Abteilungen* was advanced. Similar to other units, each *Abteilung* contained a staff battery and three combat batteries, each equipped with six *Sturmgeschütz*.

KStN 445 (*Sturmbatterie*) was replaced by KStN 446 (*Sturmbatterie im Abteilungsverband*), dated 8 July 1940. This new structure showed only a few changes. The main difference was a reduction in the strength of the battery's recovery sections. Three *schwere ZugKraftwagen* (s ZgKw) were now combined in the staff battery, and the three SdKfz 251s, used to transport the exchange crews, were substituted by ZgKw 3t (SdKfz 11).

The KStN 446, shown above, is an original document found in ALR files. It gives some further interesting information.

Although difficult to see, the statuary posts of the all SdKfz 253s were apparently deleted by hand. The vehicle of the battery leader shows a



In July 1940, it was planned for all *Sturmgeschütz-Abteilung* to have a complement of 18 vehicles.

handwritten remark '*Gesch*' indicates that battery commanders should be quickly supplied with a *Sturmgeschütz*. While the commander received an assault gun, the battery officer's armoured vehicle was replaced by a motorcycle with sidecar, the battery officer had to be content with a Kfz 15 cross-country car.

Apparently KStN 446 anticipated the coming changes and modifications which became effective in late 1941.

The document gives further interesting detail on the supply of consumable equipment.

A.) Overall strength of the battery: six officers, 36 non-commissioned officers and 116 other ranks.

B.) Ammunition

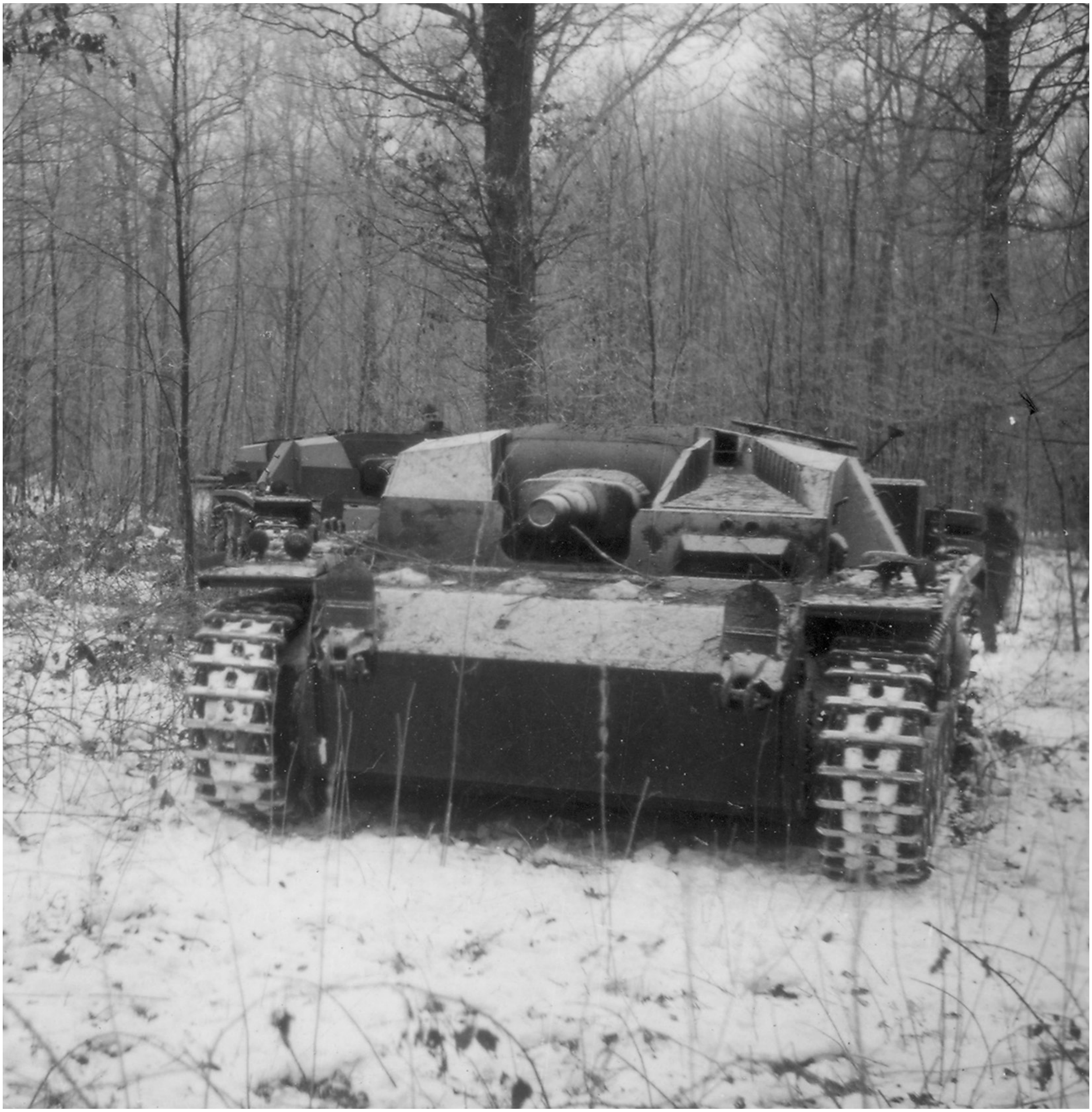
First ammunition delivery:	1,800 rounds
Distribution:	40 rounds in the *Sturmgeschütz*
	100 rounds in the legepMunKw
	60 rounds in the ammunitions trailer
	100 rounds in the ammunitions section
	Total: 300 rounds

C.) Fuel

First supply of fuel (3.5 *Verbrauchsätze*)	= 12,350ltr
Supplied as follows:	
Supply section in 321 jerry cans	= 6,420ltr
On StuGs in 39 jerry cans	= 780ltr
In StuGs' fuel tanks	= 5,150ltr

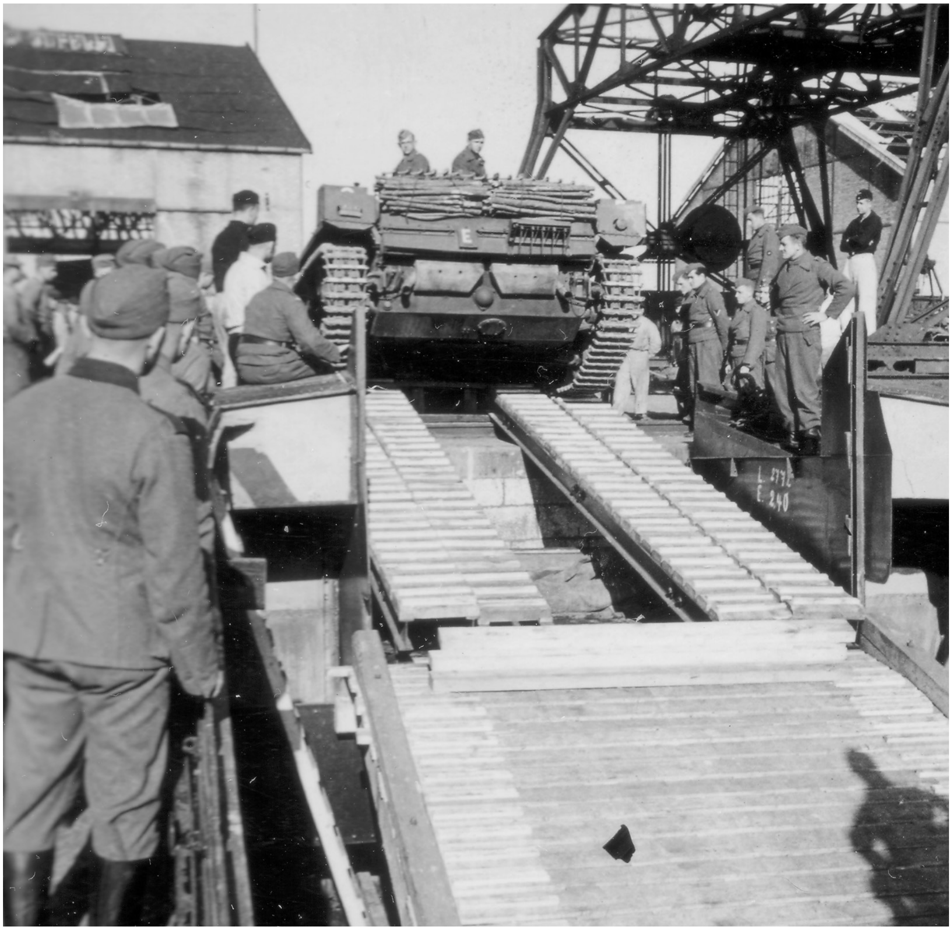
Verbrauchsãtz (VS) explains the amount of fuel required to cover 100km. The initial supplies noted in this document would be sufficient for 350km. The VS (according manual HDv 90) was given in three categories – road, light terrain and over heavy terrain. Compared with other official tables, the given consumption would correspond to the range during travel over paved roads. The 13 jerry cans carried on each *Sturmgeschütz* is a statistical figure only; such numbers were only carried on the vehicles in non-combat conditions.

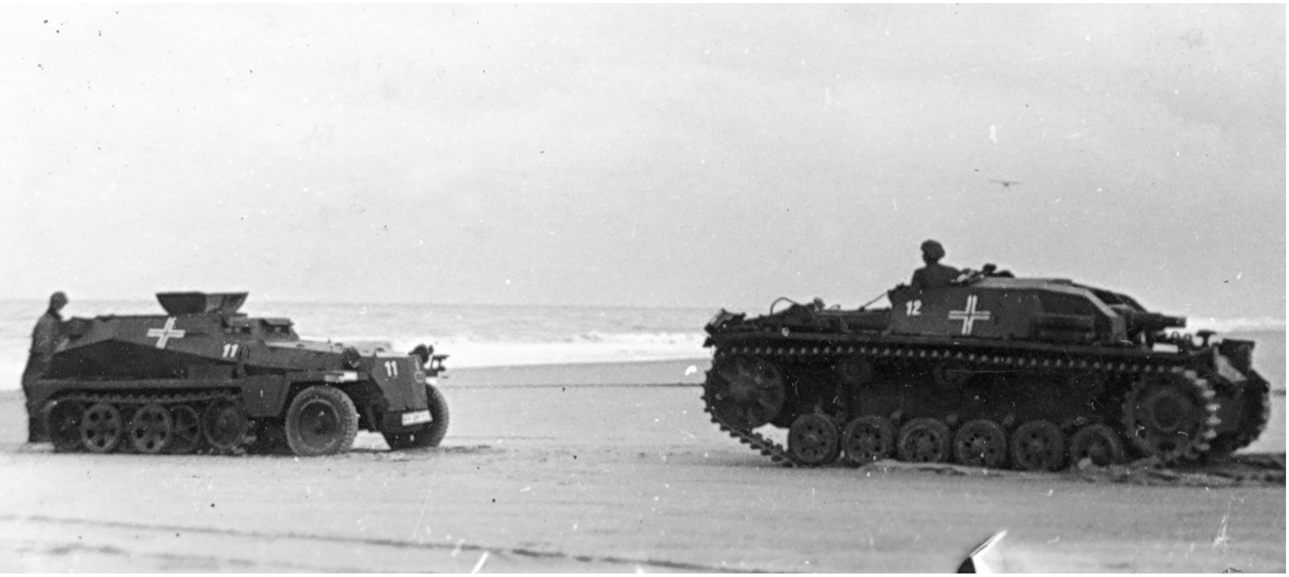
In late 1940, StuGAbt 184 was positioned to the northeast of Paris at Ermenonville, where the unit continued training operations over the winter of 1940 and 1941. Two *Sturmgeschütz* from the unit are crossing wooded area near Mortefontaine. (Anderson)

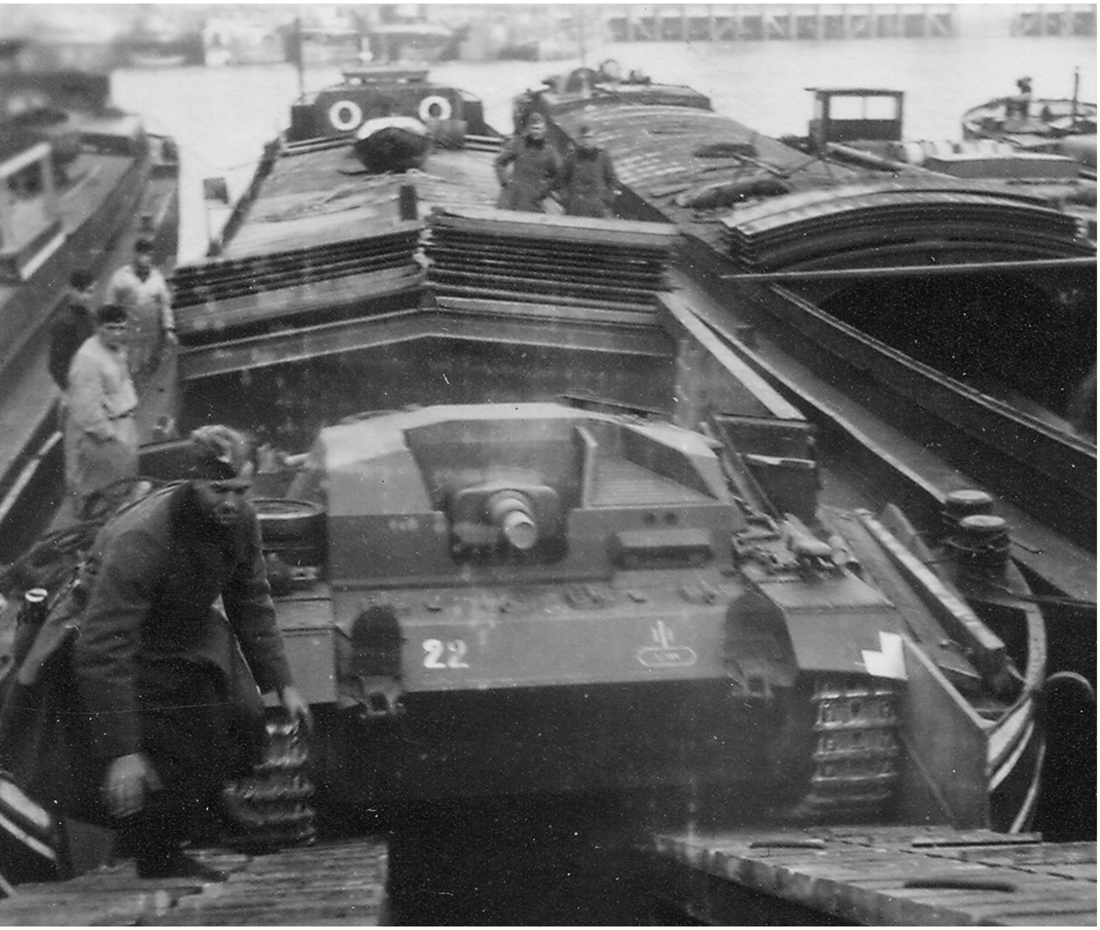


Right: *Sturmbatterie* 666 participated in the many exercises organized in preparation for Operation *Sealion*. Here a *Sturmgeschütz* is loaded in one of the many improvised landing craft. (Anderson)

Below: A *Sturmgeschütz* of StuGAbt 184 tows a broken-down SdKfz 253 away from the advancing tide during pre-invasion training on a beach in northern France.

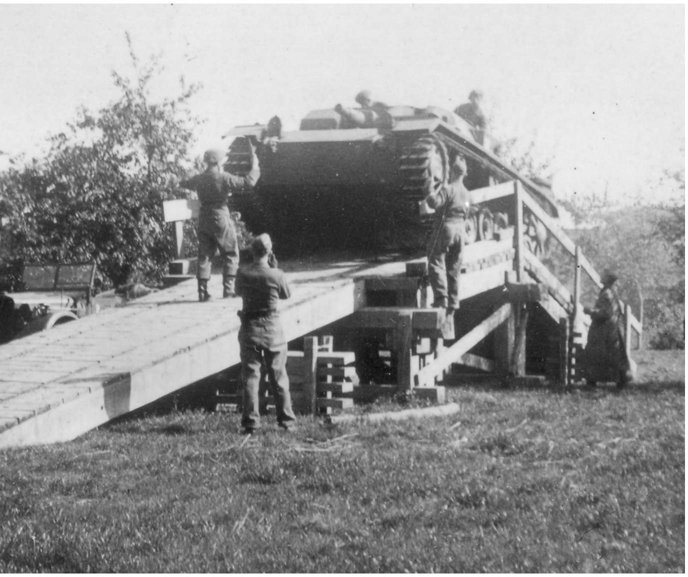






Left: Many different types of vessel, from river barges to *Marinefährprahm* (special landing craft), were prepared for the planned landings. Here a *Sturmgeschütz* of StuGAbt 184 is carefully manoeuvred into the hold of a river barge. (Von Aufseß)

Below: Men of 2./StuGAbt 184 carefully watch the use of specially fabricated wooden ramps during a loading and unloading exercise. (Anderson)



The Balkans and *Barbarossa*

4

The dramatic end to 1940 was to set the course of the war for the following years. In late 1939, Hitler had ordered the preparatory planning for the invasion of Great Britain, which he saw as his most dangerous opponent in Western Europe. After the invasion of France the preparations continued as landing equipment, including specifically modified river barges was assembled in French, Belgian and Dutch ports on the Channel coast. By September, sufficient vessels had been collected – more than 150 cargo ships, some 2,000 barges and 1,500 other ships. However, important pioneer equipment, essential for the initial phase of an invasion, was not available. German forces were forced to improvise during their preparations.

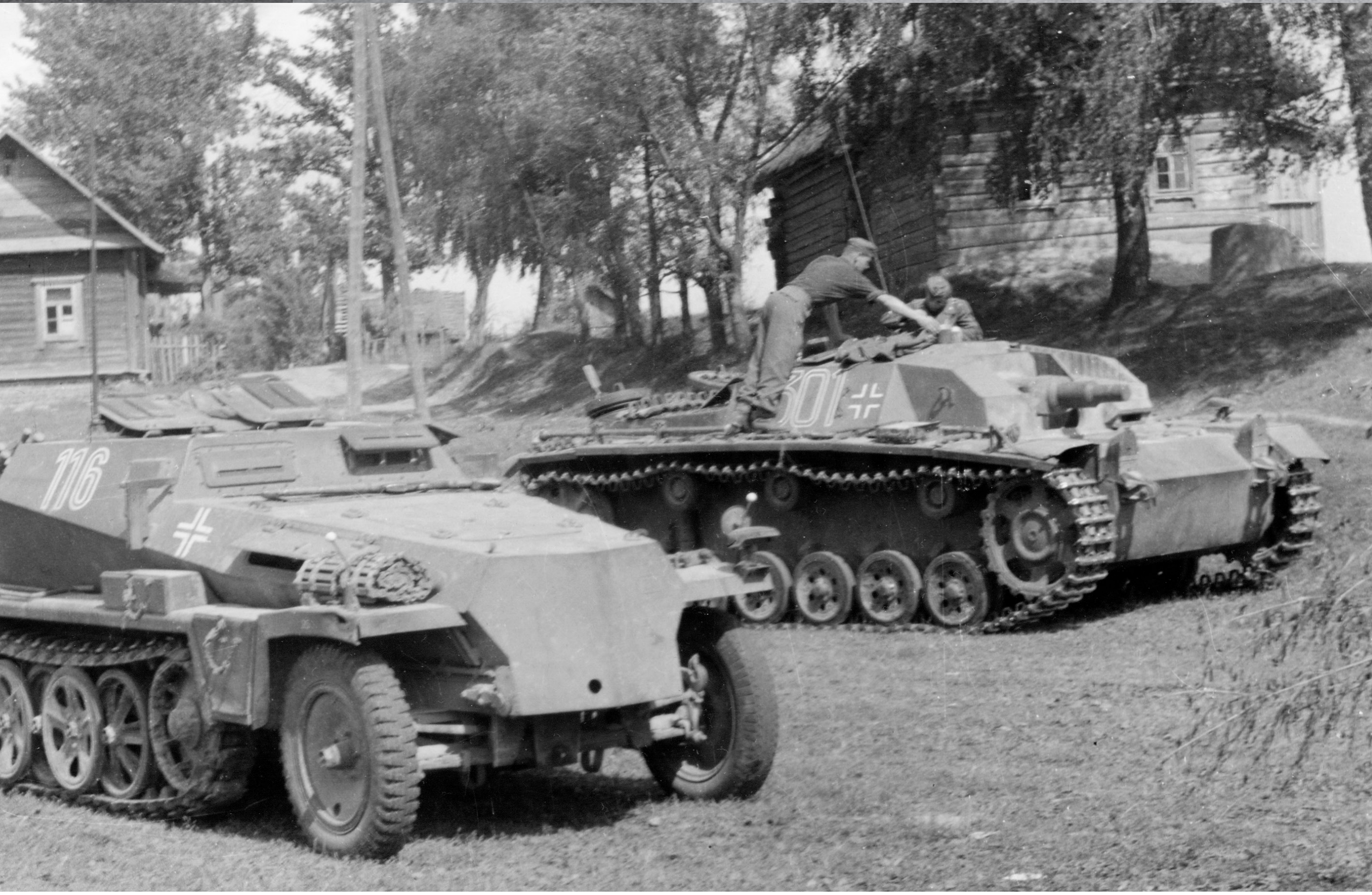
All German forces stationed in France, including some *Sturmartillerie* units, participated in the landing exercises.

Despite the preparations for an invasion, Hitler attempted to negotiate a peace with Great Britain – in secrecy – but the overtures were rejected by the British in the face of heavy German air raids during the Battle of Britain.

However, the *Luftwaffe* proved unable to neutralize the Royal Air Force – certainly the greatest hindrance to a landing operation. When the favourable weather conditions of mid-September passed, Operation *Sealion* was postponed until the spring of 1941. This was seen at the same time as an indirect cancellation as, on 18 December 1940, Hitler had informed his military about his plans to invade the Soviet Union in May 1941. From the order of deployment:

> If Russia were to change its earlier position against Germany, all measures have to be taken to overwhelm Soviet Russia in a quick campaign as a safety precaution, even before the war against Britain has ended.

A *Sturmgeschutz* Ausf C leads an infantry column toward the town of Dorozobuzh, near Smolensk during the advance on Moscow. Ominously, the first snow of winter has fallen. (Getty)



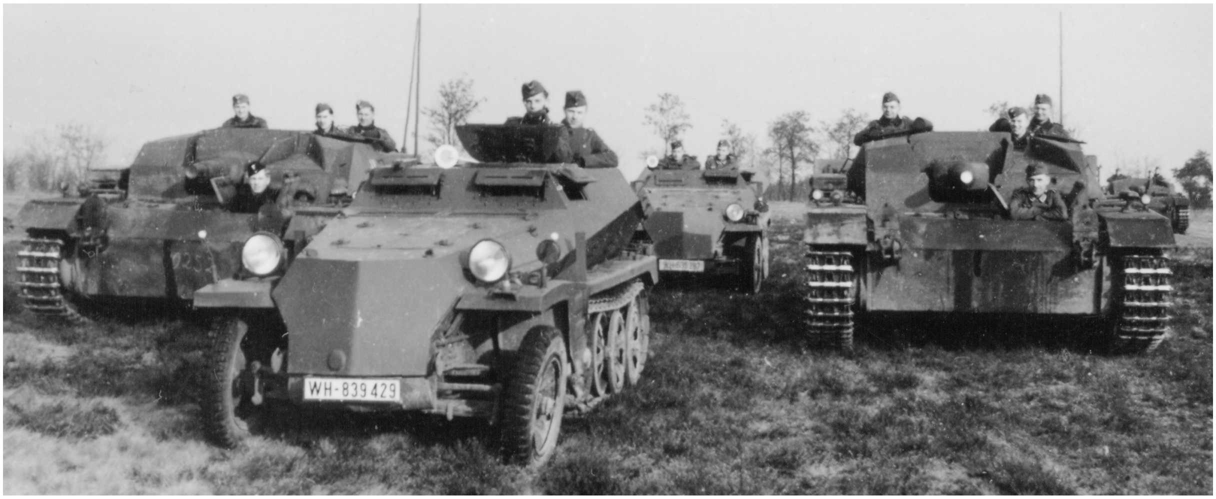
An SdKfz 253 and a *Sturmgeschütz* Ausf B of StuGAbt 201 prior to Operation *Barbarossa*. In April 1941 the unit was transferred to the region around Warsaw. (Anderson)

A few days earlier, on 13 December, Hitler made his decision to invade Greece (Operation *Marita*) in order to relieve his ally and 'friend' Benito Mussolini – *Il Duce*. Facing the enormity of the challenge, Operation *Sealion* was consigned to history. Greece was of great importance for Hitler, since any British forces stationed there would be a permanent danger to oil supplies for the Reich. Furthermore, problems with the planned Operation *Barbarossa* had become apparent, as Hitler worried about his southern flank.

On 27 March 1941, a military *coup d'état* in Yugoslavia, led by General Simovitch, caused a new dilemma. Hitler now had to expand Operation *Marita* with the aim to invade not only Greece, but also the Balkan countries.

By late 1940, six *Sturmgeschütz-Abteilungen* had been established and some were sent to France as part of the occupation force, and also to train for Operation *Sealion*:

StuGAbt 184 established by October 1940
StuGAbt 185 established by August 1940
StuGAbt 190 established by October 1940
StuGAbt 191 established by October 1940
StuGAbt 192 established by November 1940
StuGAbt 197 established by November 1940

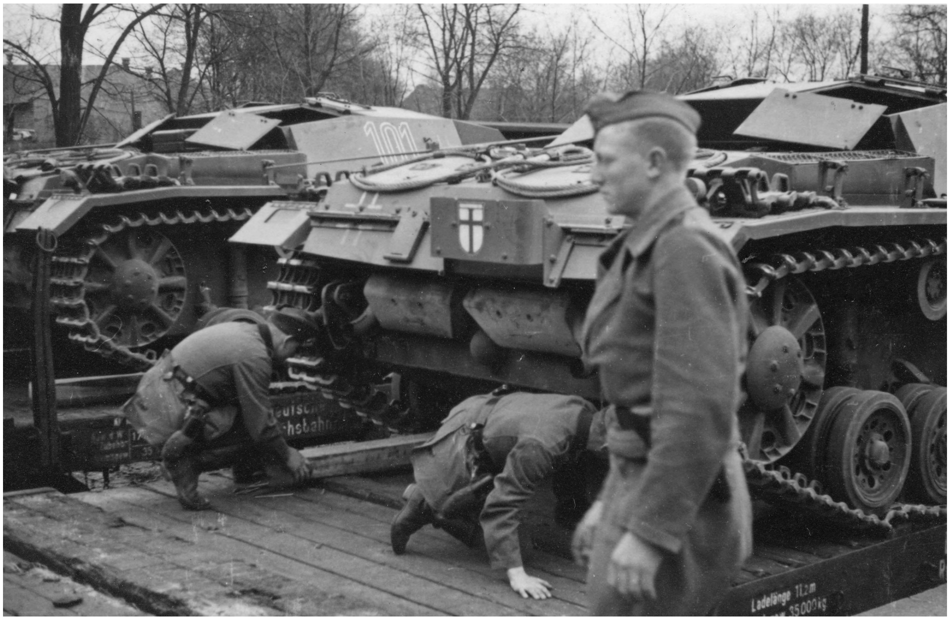


Above: Vehicles of *Sturmbatterie* 665 (later renamed *Sturmgeschütz-Batterie* 665) at the end of 1940, the unit was sent to Prussia accompanied by StuBttr 659, 660 and 666. (Hoppe)

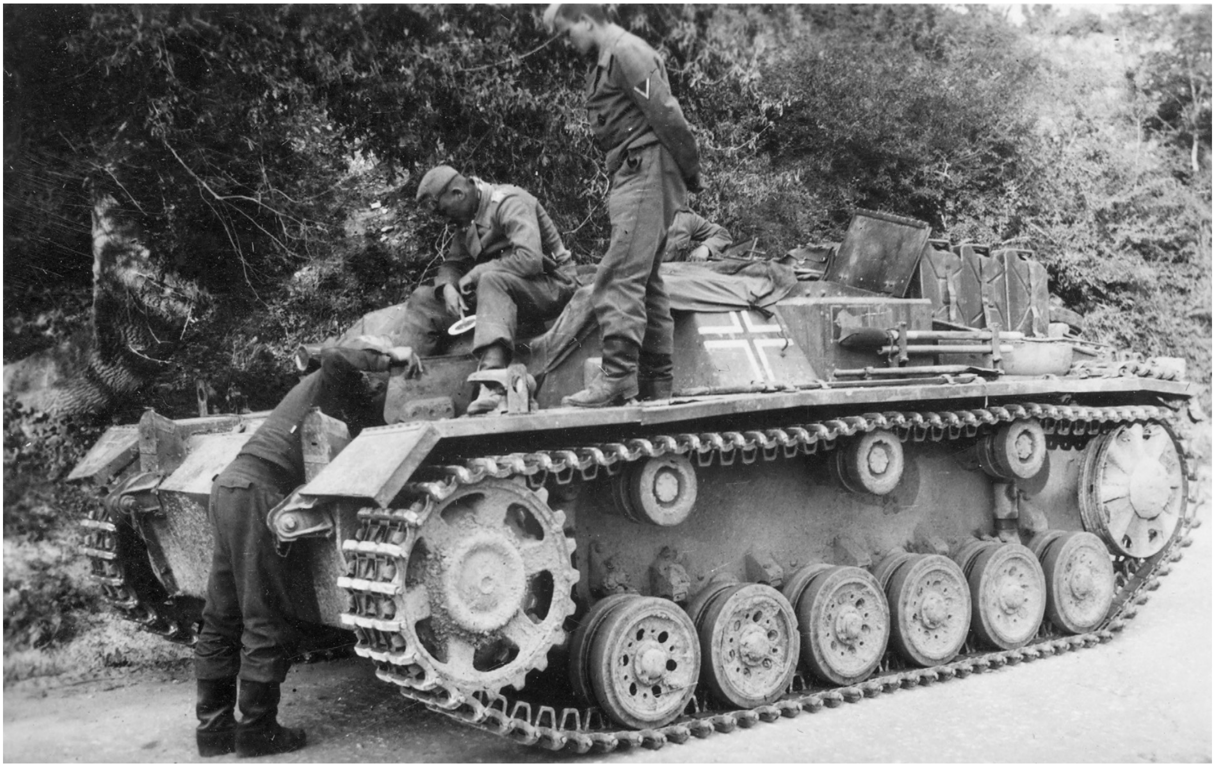
At that time there was some confusion regarding the designations, with some documents still using the terms *Sturmbatterie*, *Sturmartillerie-Abteilung* and *Sturmabteilung*. However, as time passed the designations *Sturmgeschütz-Batterie* and *Sturmgeschütz-Abteilung* became the norm.

StuGAbt 203 was also established in January 1941, both StuGAbt 210 and 226 followed in March and April. A further unit, StuGAbt 201, was to be ready for action on 18 April. All were formed according KStN 446, dated 8 July 1940.

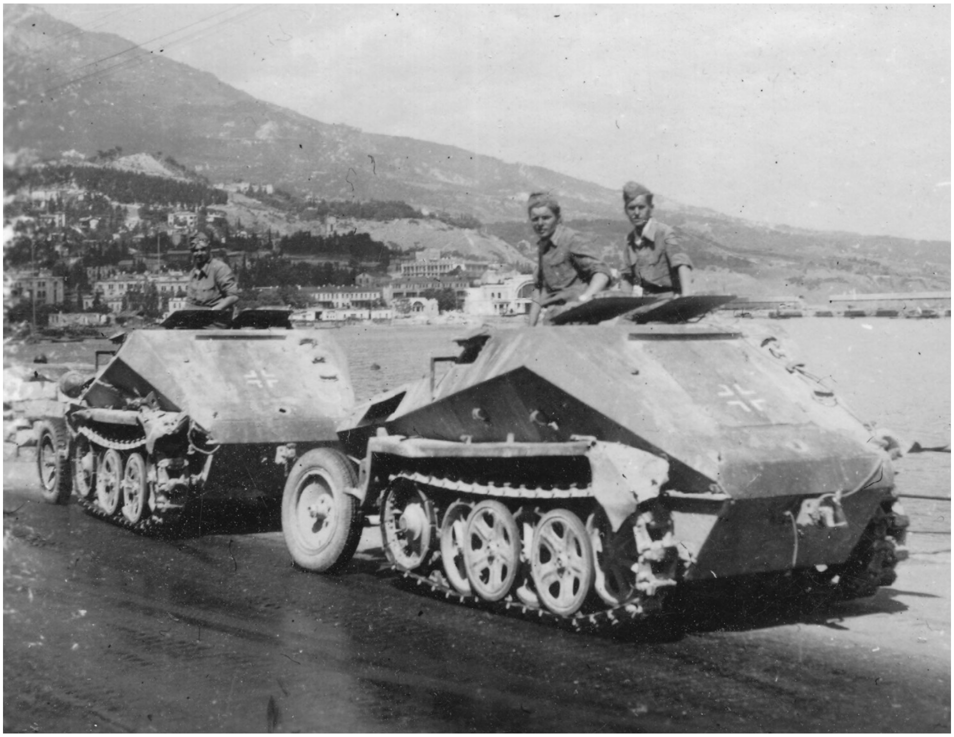
By the end of 1941, the five remaining *Sturmbatterien* (659, 660, 665, 666, and 667) were sent to the north-eastern districts of the Reich, still operating as independent *Heerestruppen* (Headquarters troops).



Left: Men of StuGAbt 184 prepare their vehicles for transport by rail to the east. The unit had the distinctive emblem of a red cross on white ground, which has been stencilled on the *Nebelkurzenabwurf-vorrichtung* (NKAV – smoke-candle firing device). (Anderson)



Above: A *Sturmgeschütz* Ausf B of StuGAbt 191 parked on a dirt track somewhere in Bulgaria. The stowage of a large number of fuel cans on the engine deck was common practice during the Balkans campaign. The charging bison emblem of StuGAbt 191 has been stencilled on the side of the superstructure and the track guard. (Anderson)



Right: Two battle-worn SdKfz 252 ammunition carriers parked on a seafront road during the advance through Greece. The high temperatures and very difficult terrain in the mountain regions of the country caused many engine and transmission failures. (Anderson)

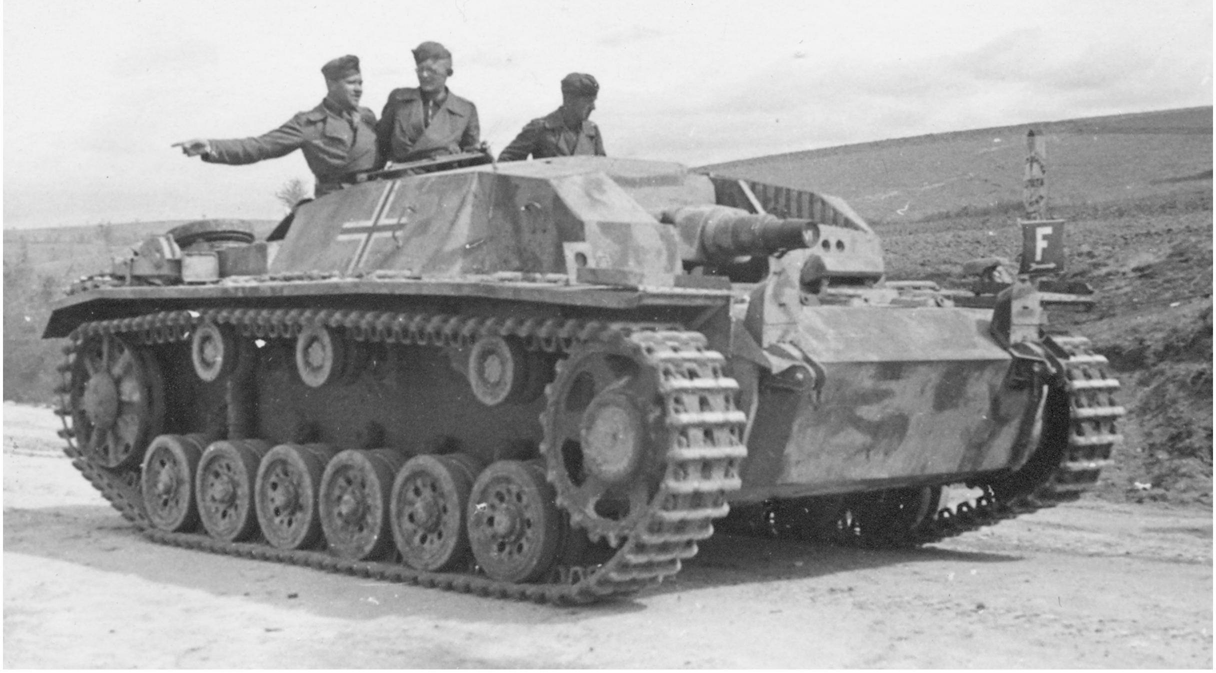
Sturmartillerie – in Combat Again

On 6 April 1941, two German armies, supported by four *Sturmgeschütz-Abteilungen*, launched the invasion of Yugoslavia and Greece. StuGAbt 184 and 197 were embedded in the 2.Army, and StuGAbt 190 and 191 with the 12.Army.

In Yugoslavia, StuGAbt 184 and 197 were to cross the river Drava, which formed a natural barrier along the border, but Yugoslav forces, apparently forewarned, had destroyed all strategically important bridges thus blocking the way for a number of units including the *Sturmgeschütz-Abteilungen*. After days of hard work, pioneer troops had managed to open some routes, but too late for StuGAbt 184 and 197 to participate in the fighting. Yugoslavia surrendered on 17 April 1940.

In Bulgaria, StuGAbt 190 and 191 began their advance to attack and break through the heavily fortified Metaxas Line and into Greece; their objective was Thessaloniki (Salonika). Official reports of the action have proven hard to locate, but *Oberleutnant* Nottebrock of StuGAbt 190 recalled:

> 1 October 1940
> Orders are given to establish *Sturmartillerie-Abteilung* 190 at Jüterbog by 31 September 1940. The timeframe is too short, since the delivery of soft-skinned vehicles, spare parts and further material causes delays.
> 15 November 1940
> Major Haupt reports that StuArtAbt 190 is combat ready.
> 28 November 1940

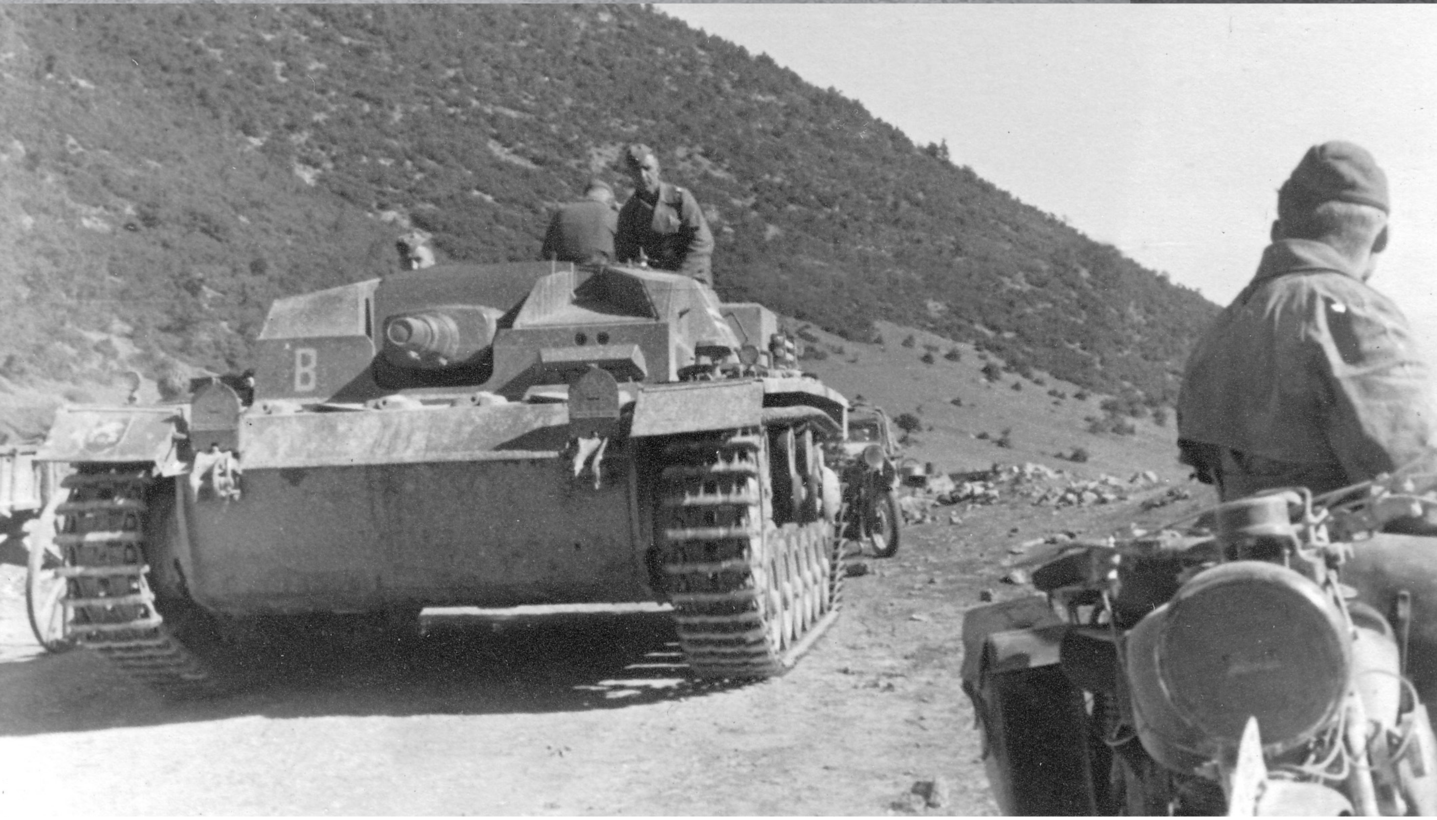


A *Sturmgeschütz* Ausf B of StuGAbt 191 (recognizable by the typical lamp cover on the track guard) on a dirt track during the advance through Greece. The original *dunkel grau* (dark grey) paint is covered with a layer of thick dust, certainly the best possible camouflage for local conditions. (Anderson)

> Arrival in Lure, Western France.
> 16 December 1940
> StuArtAbt 190 is subordinated under 72.InfDiv. In the presence of the divisional commander *General-Leutnant* von Mattenklott, the *Abteilungskommandeur* presents the unit during a large-scale exercise.
> 7 January 1941
> Entrainment at the railway freight yard Belfort, France.
> 9 March 1941
> The *Abteilung* reaches Haskovo, Bulgaria.
> 11 March 1941
> The commander's six-day reconnaissance of our combat area near the Greek border resulted in his assessment that the area is absolutely unsuitable for StuG unit combat.
> 30 March 1941
> Combat seems imminent.
> 6 April 1941
> Integration into the advance detachment under *Oberst* von Geyo, commander of InfRegt 123 at Tchorbadshisko. 4.5km after crossing the Greek border we experience unexpected heavy resistance from a five-storey strongly built fortification. After our light and heavy anti-aircraft [AA] guns have opened fire without any result, the 1.*Zug* of 3.*Batterie* became engaged. Exhausted by heavy enemy fire, our own infantry was unable to take advantage of the situation.
> 7 April 1941
> The bunker system was softened up by artillery fire and by a combined deployment of *Sturmgeschütz-Abteilung* 190 and AA guns. Following this preparatory fire, our infantry takes the positions without heavy losses within 25 minutes.
> 9 April 1941
> Around 17:00hrs, the division attacked the enemy near Pimni supported by StuGAbt 190… The *Sturmgeschütz* advanced some 100m along a dry river bed towing rubber dinghies for the pioneers. The enemy positions covered a width of 1.5km and were taken under fire. All except two well-concealed machine-gun teams were defeated. Our attacking infantry and especially the mountain infantry pioneers in their dinghies were completely defeated. The first assault had failed.
> 10 April 1941
> Since the enemy had also suffered heavy losses during the previous fighting, it was decided to launch a further assault at 01:30hrs. *Sturmgeschütz-Abteilung* 190 was the main thrust of the attack. By 02:00hrs, infantry were able to cross the Nestos [Mesta] river. Due to their outstanding accuracy our *Sturmgeschütz* played a major part in defeating the enemy bunker positions.

Although this report does not go into detail, it gives a good impression of the first days of combat. Despite the difficult terrain the *Sturmgeschütz* were able to provide valuable and accurate fire support. However, they were not able to advance with the infantry which was halted by two well-fortified machine-gun positions.

The other battalion, StuGAbt 191, was deployed to assist 72.InfDiv with



The emblem of StuGAbt 190 was a stylized lion. The *Abteilung* used an elaborate system of coloured badges to identify each battery, and a letter for each individual *Sturmgeschütz*. The rock-strewn mountain roads caused serious damage to the rubber-rimmed wheels and tracks. (Anderson)

the objective of taking the Rupel Pass, also a part of the Metaxas Line. Like StuGAbt 190, the unit was to find that the fortifications were unexpectedly strong. Also the mountainous terrain made it impossible for StuGAbt 190 to provide close-fire support for the advancing infantry and despite numerous dive-bombing attacks, by formations of Junkers Ju-87 Stukas, the Metaxas Line could not be penetrated. Nevertheless, on 9 April 1941, the Greek defenders suddenly capitulated and abandoned the fortifications, allowing German forces to travel south into Greece with little resistance during their advance. Greece surrendered on 27 April 1941, after which StuGAbt 190 was positioned in Thessaloniki before being transferred to Olmütz in Moravia in May.

Preparing for *Barbarossa*

After the end of the campaign in the Balkans, a deceptive calm prevailed. The build-up of the *Sturmartillerie* progressed and during the first six months of 1941, seven more *Sturmgeschütz-Abteilungen* were formed:

StuGAbt 203 established by February 1940
StuGAbt 201 established by March 1941
StuGAbt 210 established by March 1941
StuGAbt 226 established by April 1941
StuGAbt 243 established by May 1941
StuGAbt 244 established by June 1941
StuGAbt 245 established by June 1941

After the conclusion of the Balkan campaign, StuGAbt 190 was honoured by participating in a victory parade through Athens on 3 May 1941. Here *Sturmgeschütz* are heading towards Syntagma Square in the centre of the city. (Von Aufseß)

All were destined for the planned invasion of the Soviet Union and together with the already existing units another 12 *Abteilungen* were assembled, plus the five combat batteries.

During May 1941, three *Heeresgruppen* (army groups), *Heeresgruppe Nord* (North), *Mitte* (Centre) and *Süd* (South) were dispersed especially around the eastern borders of the Reich and also those of allied or occupied countries.

The Prypiat swamps, formed of a northern and a southern part, were a natural obstacle. The focal point of the huge operation was in the north of the Soviet Union, where two army groups were established.

Heeresgruppe Mitte

Heeresgruppe Mitte, the most powerful army group, had the task of attacking the main elements of the Soviet forces in Russia. The strong forces of *Panzertruppe* would then turn north to assist *Heeresgruppe Nord*. After Leningrad and Kronstadt had been captured, *Heeresgruppe Mitte* would begin making preparations to take Moscow, capital of the Soviet Union and centre of the military administration. The following StuGAbt units were part of the *Heerestruppen*:

StuGAbt 177
StuGAbt 189
StuGAbt 191
StuGAbt 192

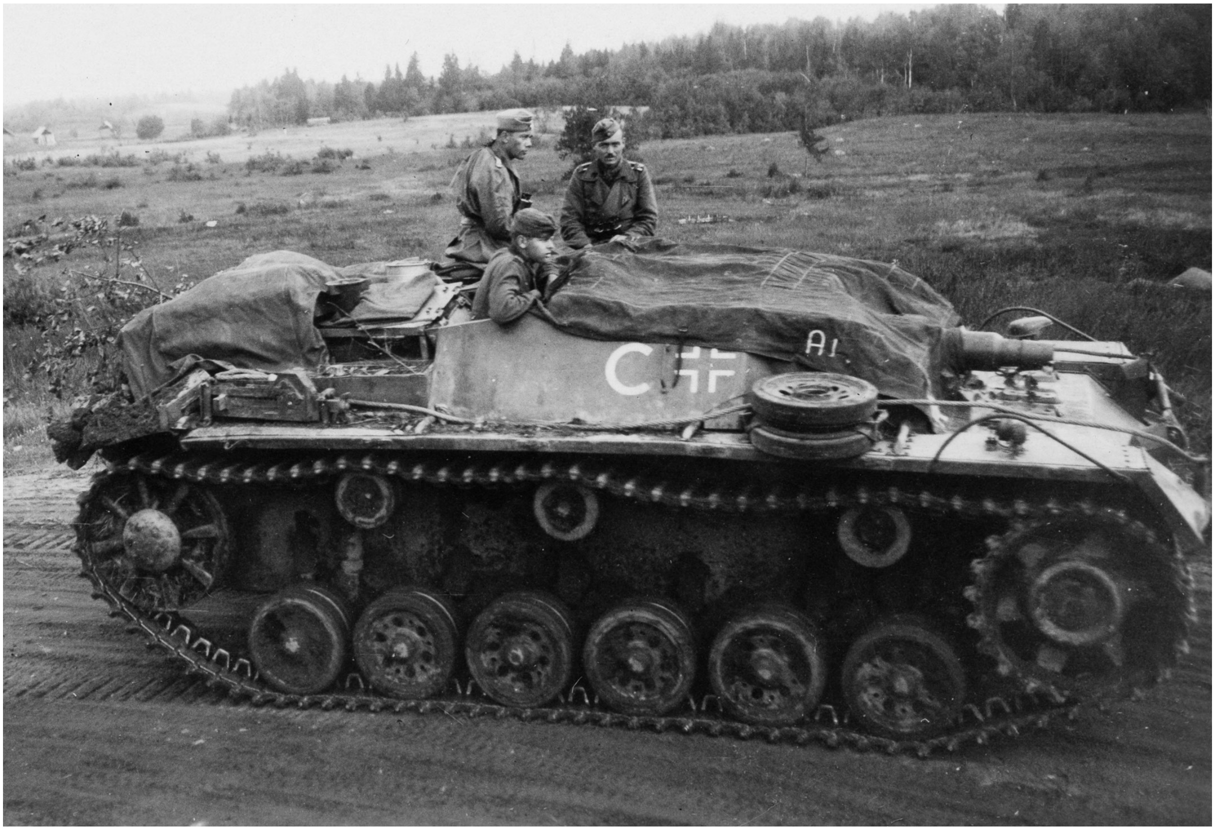
StuGAbt 201
StuGAbt 203
StuGAbt 210
StuGAbt 226

Heeresgruppe Nord

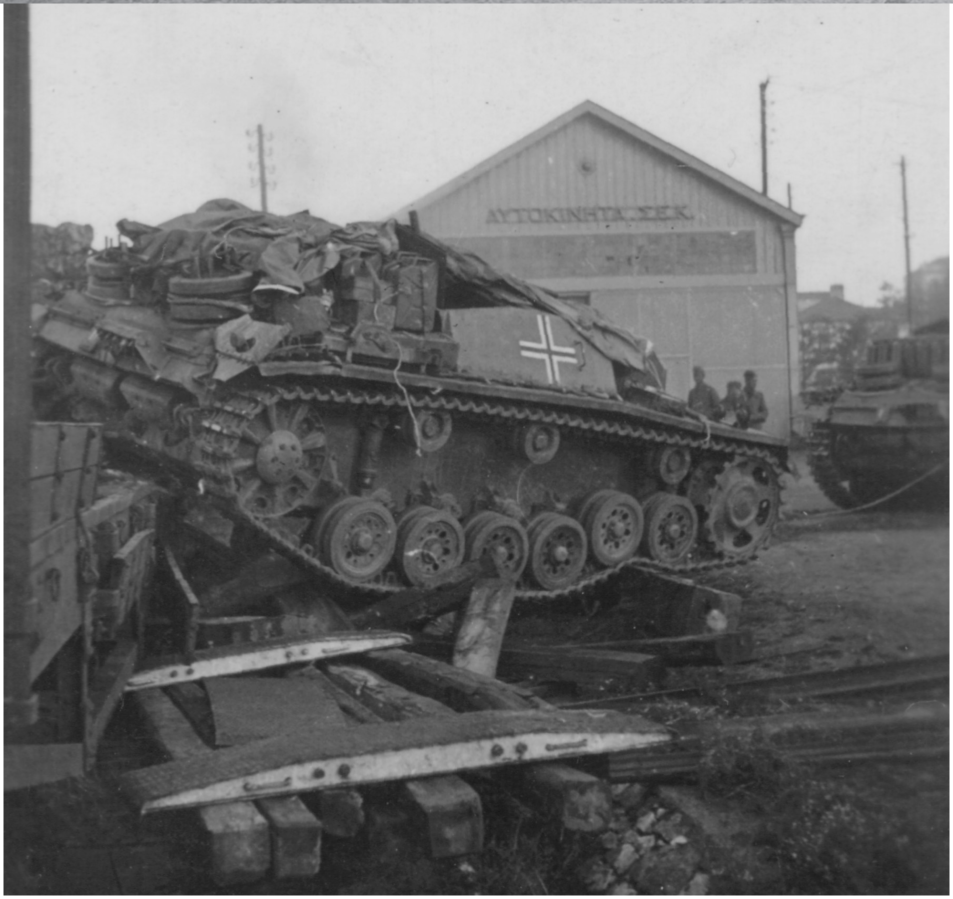
Heeresgruppe Nord was to attack from its positions in East Prussia, cross the partly occupied Baltic States and attack Leningrad, supported by elements of *Heeresgruppe Mitte*.

The five *Sturmgeschütz-Batterien* (659, 660, 665, 666 and 667) that had been established in early 1940, retained their status as independent batteries and were equipped (at least in theory) with six *Sturmgeschütz*, three SdKfz 253s and six SdKfz 252s each. They remained organized according KStN 445, dated 1 November 1939. StuGAbt 600 *zur besonderen Verwendung* (zbV – for special duties) had no *Sturmgeschütz* and served as a staff battery controlling the combat.

Two further complete *Sturmgeschütz-Abteilungen* were assembled, StuGAbt 184 and 185. These units, and all other StuGAbt deployed on the Eastern Front, had three batteries each which were organized according to KStN 446, dated 8 July 1940.



A *Sturmgeschütz* Ausf B of StuGAbt 210, on the Russian front. A large tarpaulin (from a different vehicle in the battery) has been spread over the superstructure to prevent heavy summer rain from entering the fighting compartment. The lamp covers fitted on the track guards were a distinctive feature of this unit during 1941. (Anderson)



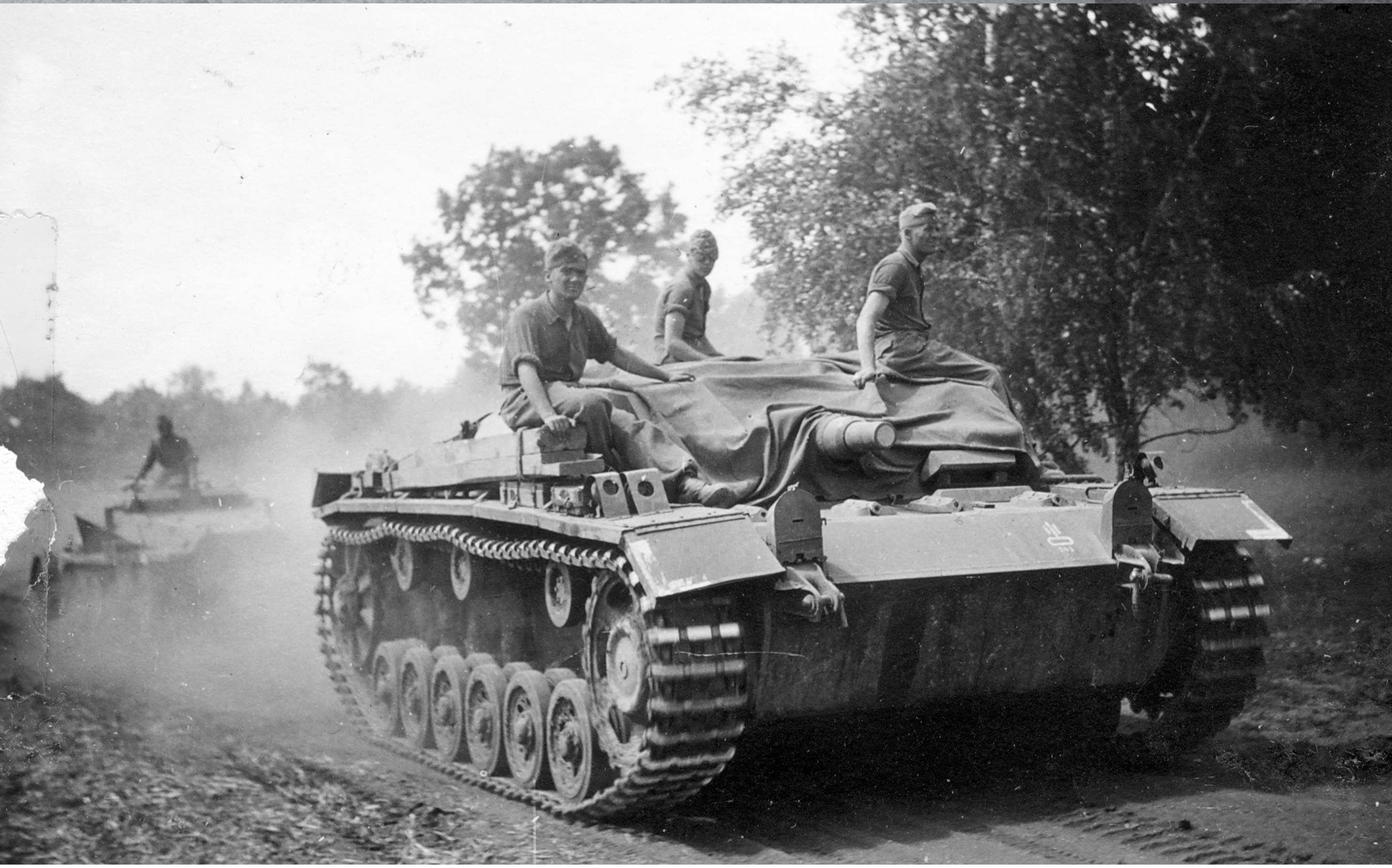
The railway network was for German armoured units of utmost importance, and it was used to efficiently transport men and their equipment over long distances. This *Sturmgeschütz* is packed with jerry cans of fuel and water and also the crew's personal gear. (Anderson)

Heeresgruppe Süd

Heeresgruppe Süd was to defeat all Soviet forces in the Ukraine and subsequently take the Donets Basin with its important defence economy. StuGAbt 190 and StuGAbt 197 were to be part of these forces. Later in the year, StuGAbt 202 and 209 were established, and were immediately sent into combat on the Eastern Front.

Organizational changes

On 18 April 1941, a new organizational structure was published, KStN 446 (*Behelf* – provisional). Sadly, no documents appear to survive, as after issue of new structures all previous versions were apparently destroyed. According to Spielberger, the majority of StuGAbt deployed on the Eastern Front were organized according to this new KStN, and he states that there were now seven *Sturmgeschütz* per battery (one additional StuG for the battery commander). The SdKfz 253 for the *Batterie-Führer* was replaced by a *Sturmgeschütz*, providing him with the same level of protection as his combat forces. His deputy, the battery officer, now had to use one of the Kfz 15 *Funkkraftwagen* (Fu) radio cars. This was a measure long overdue; now the tactical leader was able to lead his platoons from the front. The SdKfz 253 for platoon leaders were also dropped; they now used *Sturmgeschütz*.



A *Sturmgeschütz* Ausf B of StuGAbt 243, protected against the dust by a large tarpaulin, is followed by an SdKfz 252 ammunition carrier. Note the non-standard lamp guards: *Sturmgeschütz* units tended to modify their vehicles to a far greater extent than the Panzers. (Anderson)

A report on the condition of StuGAbt 184, dated 20 August 1941 stated:

> The *Abteilung* is operational with 16 out of 21 *Sturmgeschütz*. Two are total losses, a telex received states that replacements are ready; a detachment to pick them up is on the way to Borišova. Due to worn out tracks the breakdown of a further two to three *Sturmgeschütz* can be expected… The further usage of *Zugkraftwagen* [halftrack vehicles] depends on the supply of rubber pads for the tracks. In summary, at this stage the *Abteilung* will be fit for another 200 to 300km of combat.

This report proves that the unit had effectively been reorganized to a *Sturmgeschütz-Abteilung* with 21 vehicles in accordance with KStN 446 (*Behelf*). A month later, five *Sturmgeschütz* and two SdKfz253s were reported to be out of action. In October, only 1.*Batterie* was reported to be combat ready, but had requested to be re-equipped.

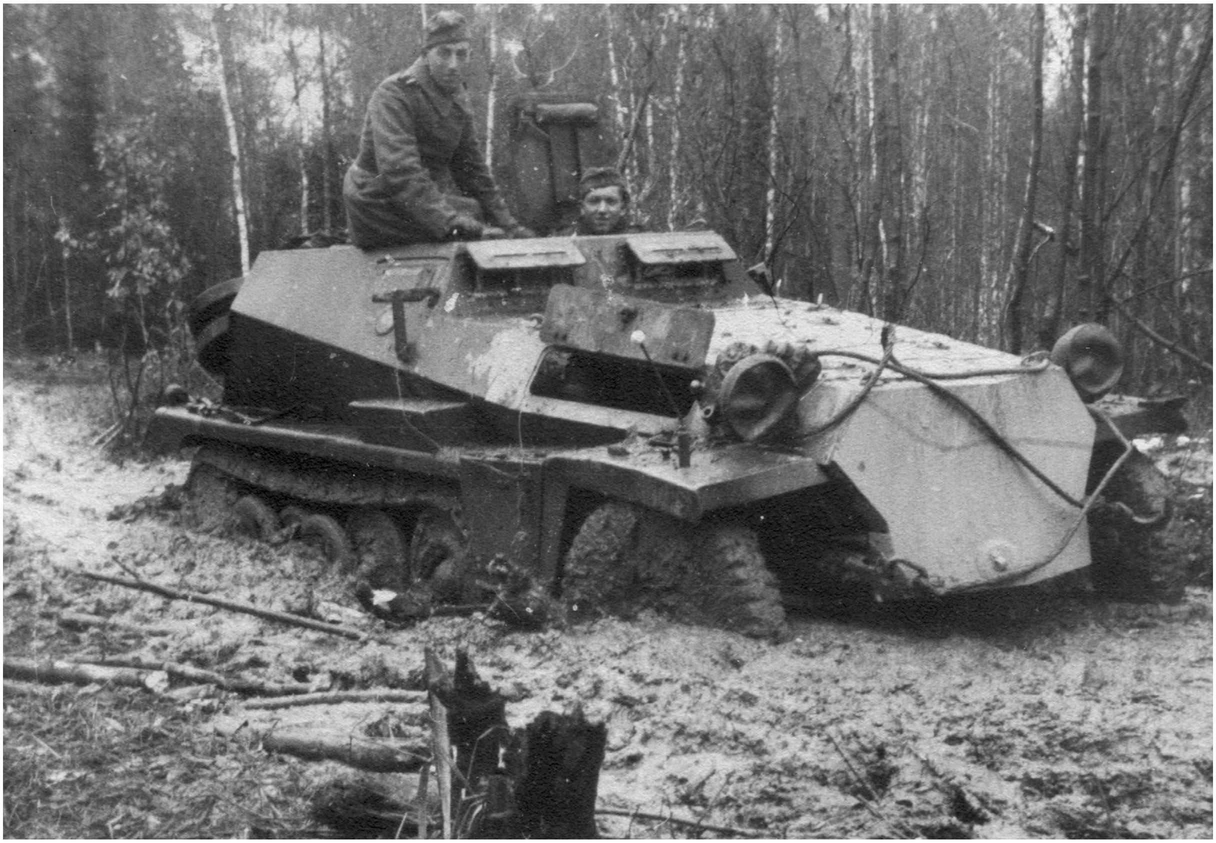
By the end of 1941, the temporary organizational structure KStN 446 (*Behelf*) was replaced by the new standard KStN 446, dated 1 November 1941. This new structure was valid for both independent batteries and for those within the scope of a battalion. Furthermore, it also allowed the establishment of seven or even ten *Sturmgeschütz* per battery according to their planned deployment.

The number of ammunition carriers in each platoon was halved, and according to the KStN the open-topped SdKfz 250/6 were replaced by the more specialized fully-armoured SdKfz 252. However, photographic evidence proves that the SdKfz 250/6 were still in service long into 1942 and beyond. The number of vehicles to carry replacement crews (one SdKfz 251 per platoon as issued in early 1940 or one SdKfz 11 per platoon as of late 1940) was reduced to one light truck from the *Gefechtstross* (supply column). It is not known whether this was ordered as a consequence of combat experiences or simply due to the desperate supply situation.

Depending on the tactical position or the supply situation, a *Batterie* or *Abteilung* commander was free to rearrange his unit. During combat, the reduction from three platoons to two in each battery was not a rare occurrence. All surplus vehicles, including motorcycles and armoured ammunition carriers were integrated into the *Batterietrupp* (staff section).

However, wartime documents prove that by 1941/42 no *Sturmgeschütz-Abteilungen* were equipped with batteries of ten *Sturmgeschütz*, a total of seven remaining the standard strength.

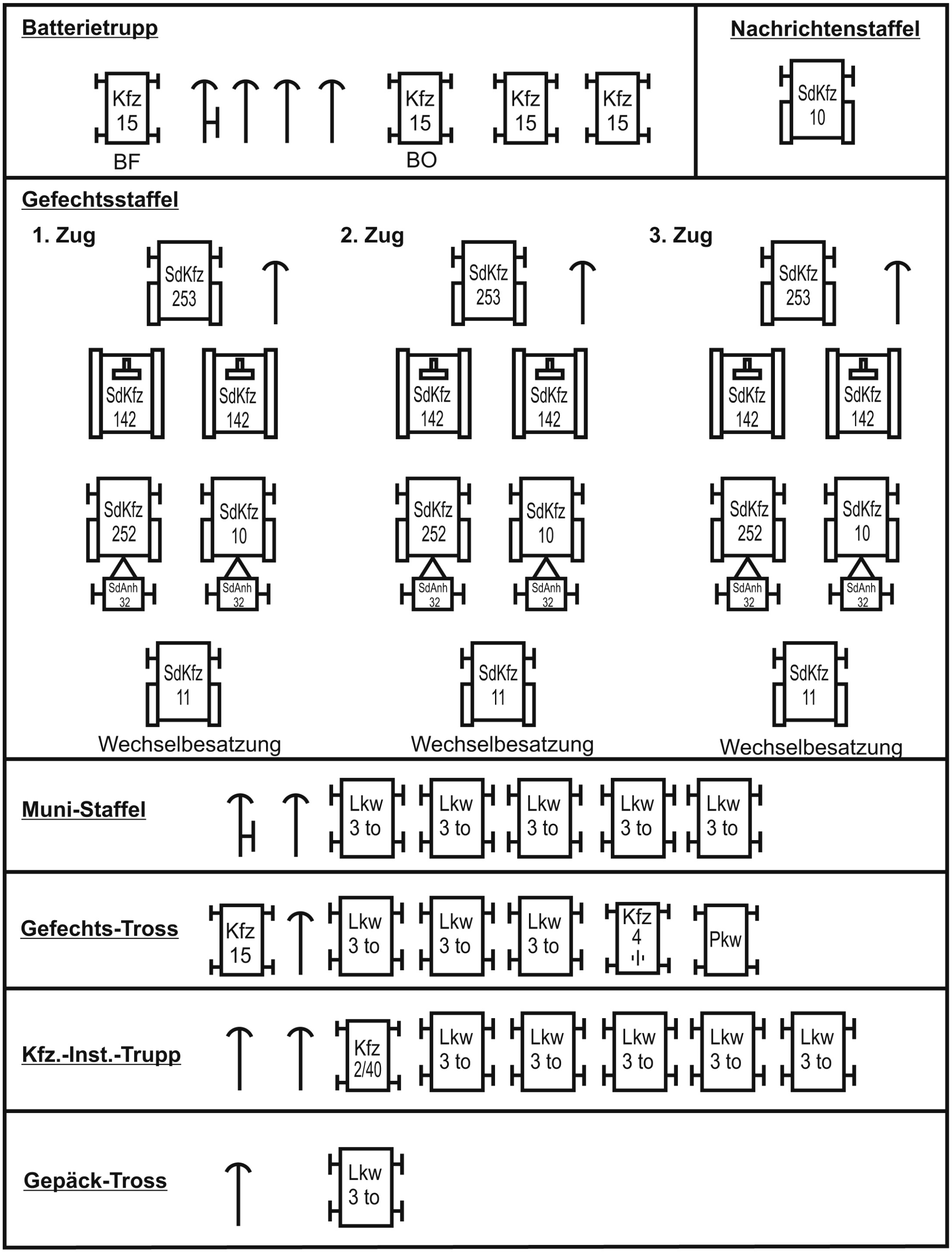
The official after-action report of StuGAbt 185, published on 1 January 1942, which covered six months of combat on the Eastern Front, proves that the old structure was still in use. Unlike StuGAbt 184, in June 1941



The SdKfz 252, like all other light armoured halftracks, lacked a driven front axle and as a consequence of the heavy rain showers of summer often became stuck in the resultant mud. Also the tracks would become clogged and the lack of traction would cause the engine to overheat. (Anderson)

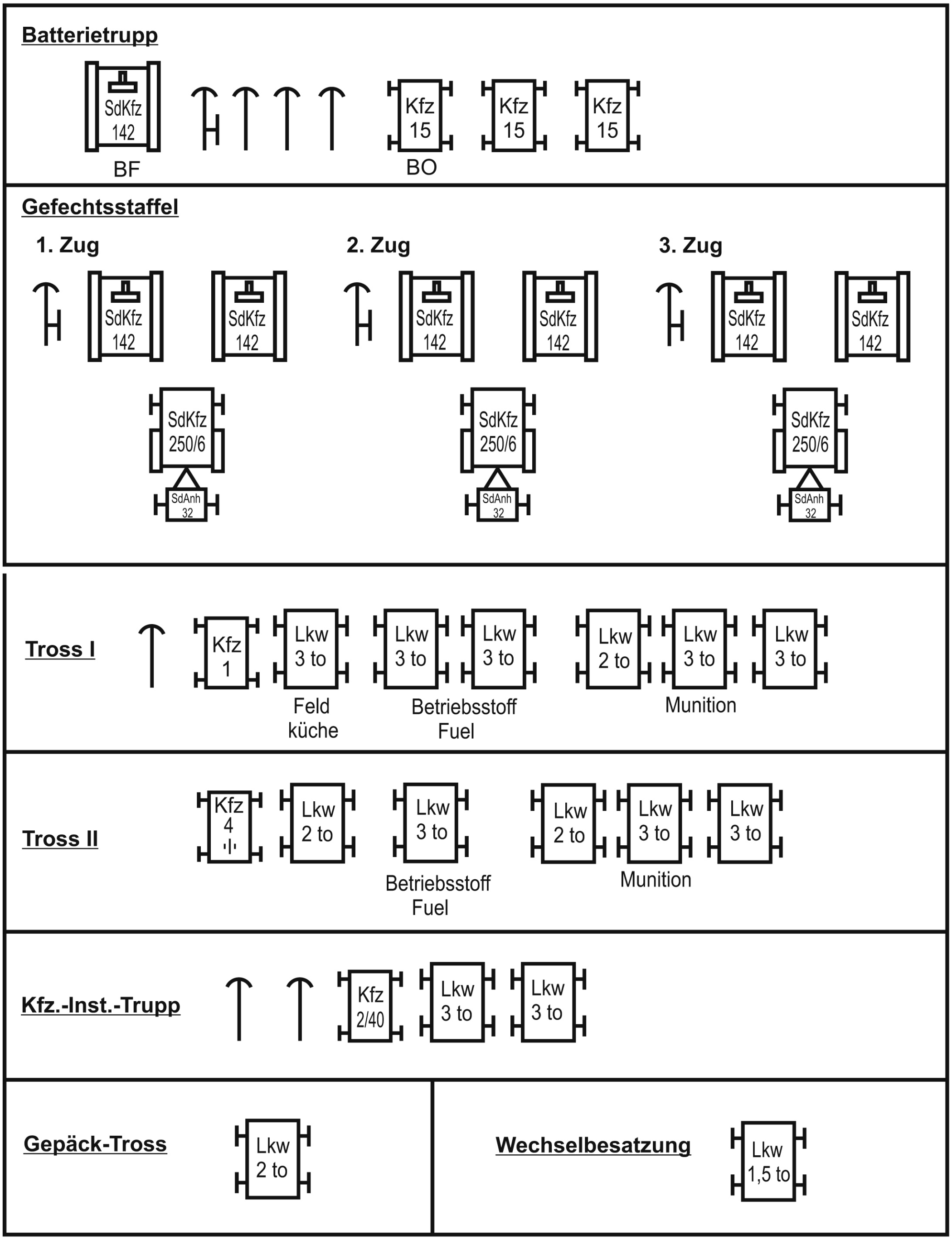
Sturmgeschützbatterie

Table of organization, actual structure as reported by StuGAbt 185 as of June 1941


Batterietrupp
Kfz 15
BF
Kfz 15
BO
Kfz 15
Kfz 15
Nachrichtenstaffel
SdKfz 10
Gefechtsstaffel
1. Zug
SdKfz 253
SdKfz 142
SdKfz 142
SdKfz 252
SdAnh 32
SdKfz 10
SdAnh 32
SdKfz 11
Wechselbesatzung
2. Zug
SdKfz 253
SdKfz 142
SdKfz 142
SdKfz 252
SdAnh 32
SdKfz 10
SdAnh 32
SdKfz 11
Wechselbesatzung
3. Zug
SdKfz 253
SdKfz 142
SdKfz 142
SdKfz 252
SdAnh 32
SdKfz 10
SdAnh 32
SdKfz 11
Wechselbesatzung
Muni-Staffel
Lkw 3 to
Lkw 3 to
Lkw 3 to
Lkw 3 to
Lkw 3 to
Gefechts-Tross
Kfz 15
Lkw 3 to
Lkw 3 to
Lkw 3 to
Kfz 4
Pkw
Kfz.-Inst.-Trupp
Kfz 2/40
Lkw 3 to
Lkw 3 to
Lkw 3 to
Lkw 3 to
Lkw 3 to
Gepäck-Tross
Lkw 3 to

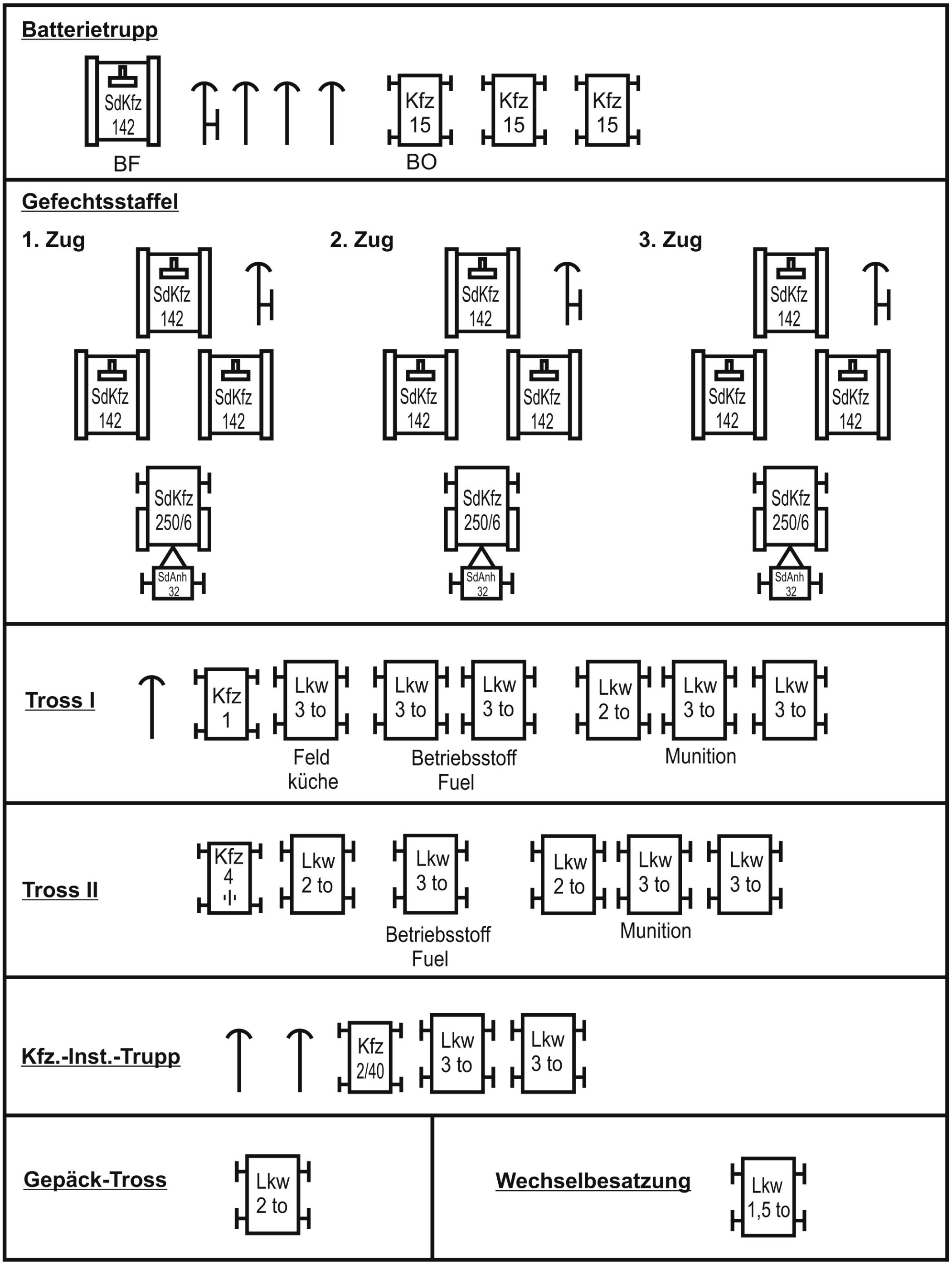
Sturmgeschützbatterie

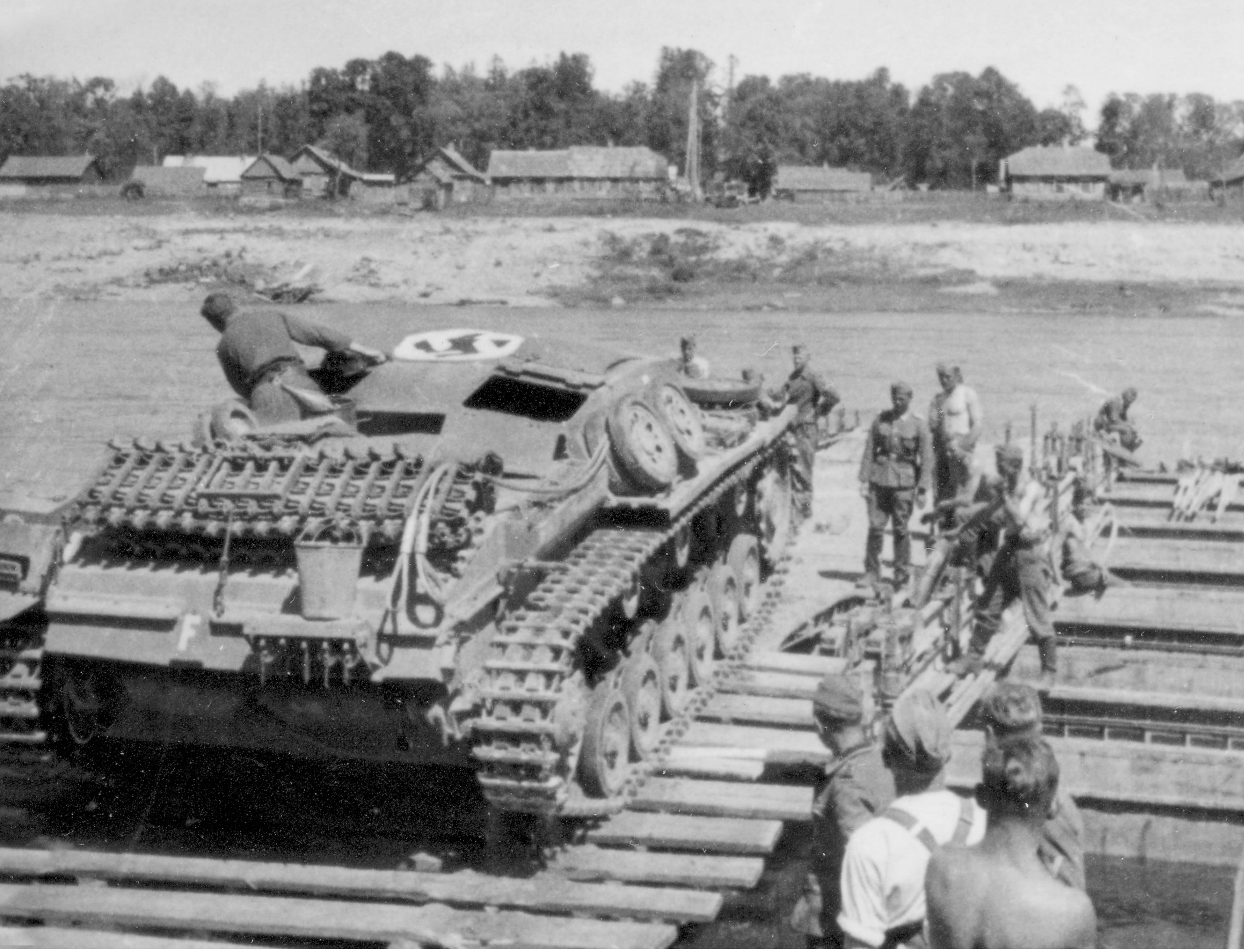
Table of organization, (Seven StuGs) according to KStN 446, dated 1 November 1941


Batterietrupp
SdKfz 142
BF
Kfz 15
BO
Kfz 15
Kfz 15
Gefechtsstaffel
1. Zug
SdKfz 142
SdKfz 142
SdKfz 250/6
SdAnh 32
2. Zug
SdKfz 142
SdKfz 142
SdKfz 250/6
SdAnh 32
3. Zug
SdKfz 142
SdKfz 142
SdKfz 250/6
SdAnh 32
Tross I
Kfz 1
Lkw 3 to
Feld küche
Lkw 3 to
Lkw 3 to
Betriebsstoff Fuel
Lkw 2 to
Lkw 3 to
Lkw 3 to
Munition
Tross II
Kfz 4
Lkw 2 to
Lkw 3 to
Betriebsstoff Fuel
Lkw 2 to
Lkw 3 to
Lkw 3 to
Munition
Kfz.-Inst.-Trupp
Kfz 2/40
Lkw 3 to
Lkw 3 to
Gepäck-Tross
Lkw 2 to
Wechselbesatzung
Lkw 1,5 to

Sturmgeschützbatterie

Table of organization, (Ten StuGs) according to KStN 446, dated 1 November 1941


Batterietrupp
SdKfz 142
BF
Kfz 15
BO
Kfz 15
Kfz 15
Gefechtsstaffel
1. Zug
SdKfz 142
SdKfz 142
SdKfz 142
SdKfz 250/6
SdAnh 32
2. Zug
SdKfz 142
SdKfz 142
SdKfz 142
SdKfz 250/6
SdAnh 32
3. Zug
SdKfz 142
SdKfz 142
SdKfz 142
SdKfz 250/6
SdAnh 32
Tross I
Kfz 1
Lkw 3 to
Feld küche
Lkw 3 to
Lkw 3 to
Betriebsstoff Fuel
Lkw 2 to
Lkw 3 to
Lkw 3 to
Munition
Tross II
Kfz 4
Lkw 2 to
Lkw 3 to
Betriebsstoff Fuel
Lkw 2 to
Lkw 3 to
Lkw 3 to
Munition
Kfz.-Inst.-Trupp
Kfz 2/40
Lkw 3 to
Lkw 3 to
Gepäck-Tross
Lkw 2 to
Wechselbesatzung
Lkw 1,5 to



A *Sturmgeschütz* of StuGBttr 666, with a large swastika flag spread over the roof to avoid attack by the *Luftwaffe*, being transported over a river on a pontoon ferry. The poor infrastructure of Russia caused numerous difficulties for German engineer and pioneer units in many areas of the front line. (Anderson)

StuGAbt 185 was still organized according the July 1940 structure in having six *Sturmgeschütz* and one SdKfz 253 in each battery. The two SdKfz 253s for the staff section in the battery were apparently dropped, as detailed in a sketch published with the experience report. Both the battery commander and battery officer now relied on a Kfz 15 cross-country car.

Combat in Difficult Conditions

Original planning proposed to subordinate all *Sturmgeschütz-Abteilungen* under an infantry division; their assignment was to support any attack mission. This was also suggested repeatedly in after-action reports written after the French campaign.

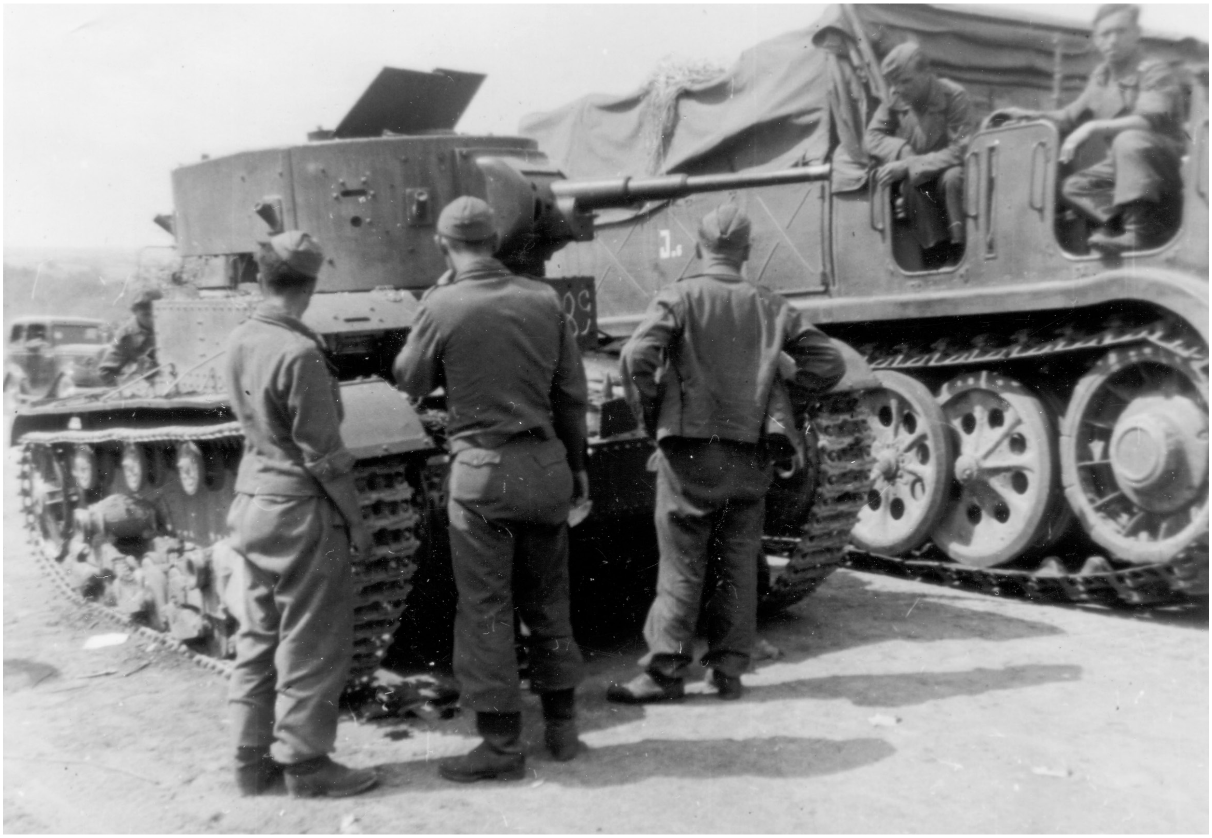
However, production of the *Sturmgeschutz* continued at a slow pace, and although there was a moderate increase, there were never enough to establish sufficient units. This led to a disorganized deployment, and many

Abteilungen lost contact and then subordinated under different divisions, very often over distances of 100km and more. The supply and support elements had to be distributed among the sub-units as quickly as possible; a very difficult task. Even worse, tactical leadership by the *Abteilungskommandeur* became impossible, as he and his deputy were forced to rush from one point of attack to another. Being under the direct command of infantry leaders unacquainted with the strengths and weaknesses of the *Sturmgeschütz*, they were often deployed on combat missions for which they were not designed.

Operation *Barbarossa*

During previous deployments, the *Sturmgeschütz* were used on the battlefront for only a limited period, and were rarely used for tank-versus-tank combat. But all this would change when Operation *Barbarossa* was launched on 22 June 1941.

Despite prewar German-Soviet cooperation, the *Abteilung Fremde Heere Ost* (military intelligence battalion east) was completely unaware of the many changes to the military in the east. Soviet Russia was considered to be an underdeveloped country; a weak giant easy to overwhelm with a swift, powerful and concerted military thrust.



In the initial phase of Operation *Barbarossa*, the T-26 and the BT formed the main part of the Soviet tank force. Here men of StuGBttr 666 closely inspect a Soviet light infantry tank before a *schwere ZugKraftwagen* 18t (SdKfz 9), from the *Bergezug* (recovery section), is used to tow it away. (Anderson)

Weak bribges were a constant source of danger to German armoured forces advancing into Russia during Operation *Barbarossa*. The first snow of winter is falling as engineers assess the recovery of a *Sturmgeschütz* from StuGAbt 177. (Getty)

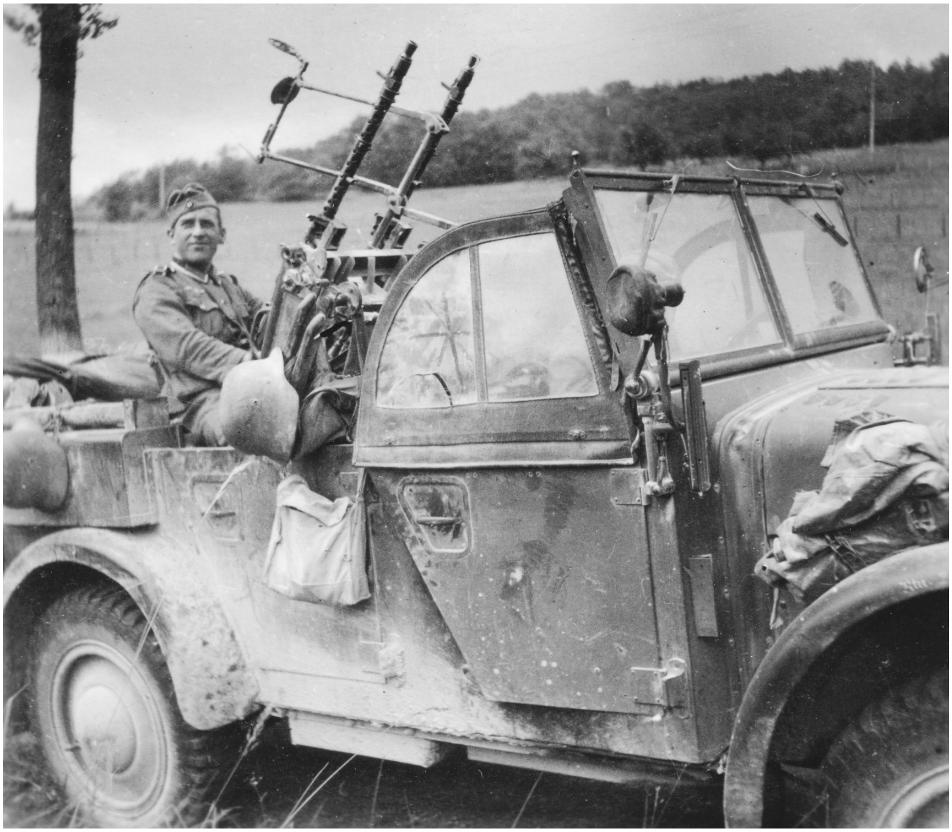
Unnoticed by the rest of the world, Russia had developed a new medium tank and a heavy tank which, although each was unique in its own way, shared many technical and mechanical details:

- A revolutionary diesel engine which gave a high power-to-weight ratio.
- Wide tracks providing excellent mobility over soft ground and snow. Ideal for Russian conditions.
- Excellent armour protection.
- A long-barrelled 76.2mm gun which had comparatively good armour penetration.

The sleek-shaped T-34 medium tank was fast and highly manoeuvrable. While its armour was only moderately thick, the use of sloping plates a very good level of protection was achieved.

The KV-1 heavy tank had a more conventional appearance, and was built with very thick (up to 100mm) armour.

Early in the invasion, German forces encountered enormous formations of 1930s-era Russian tanks. Despite the large numbers (an estimated 10,000, T-26s and some 7,500, BT-5s and BT-7s) they were easily defeated by German *Panzerdivisionen* as they advanced deep into Soviet territory.



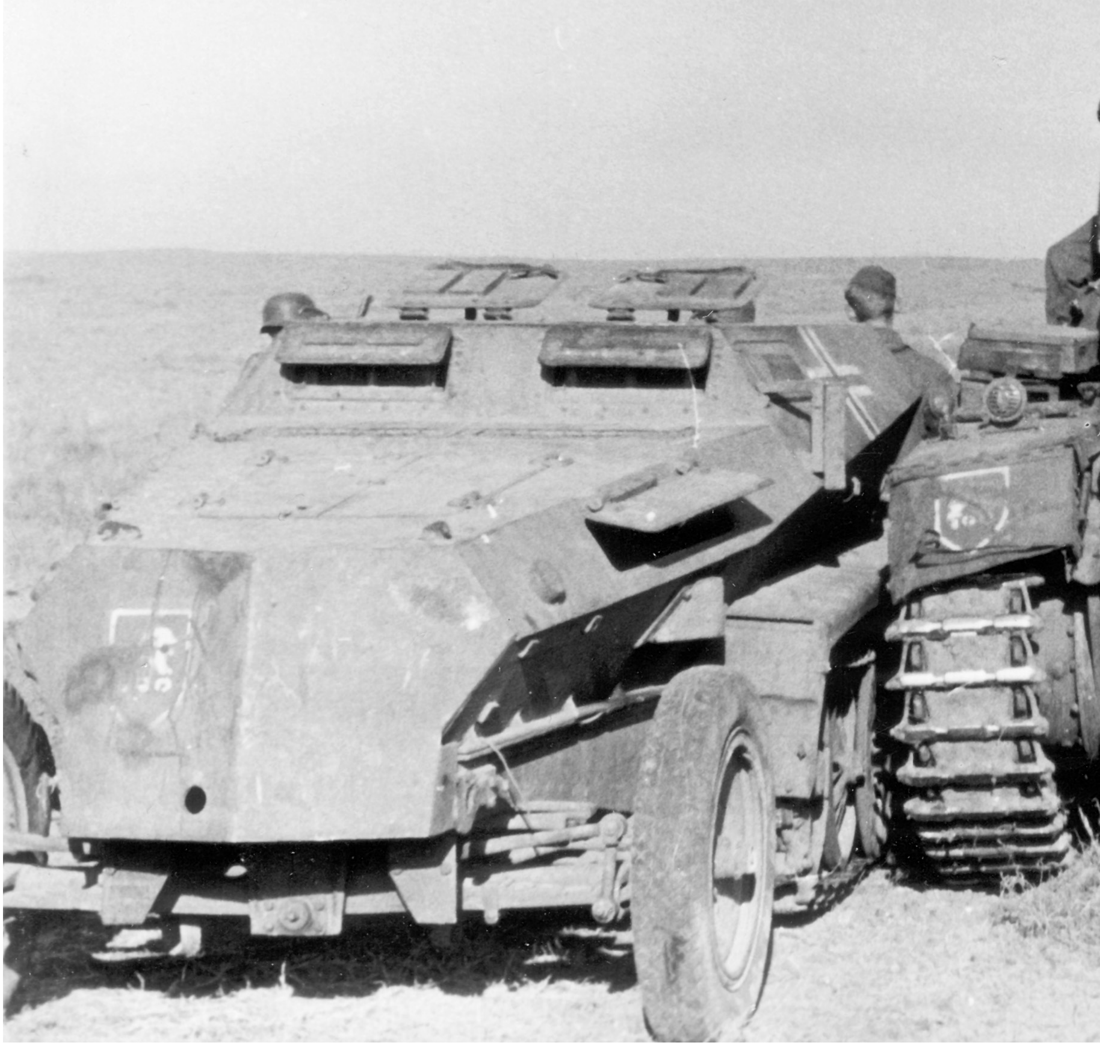
During the early phases of the war, German units had only limited protection against air attack. To overcome this lack, all StuBttr were supplied with the Stoewer (Kfz 4) cross-country car, lightly modified as a *Truppenluftschutzwagen* (anti-aircraft vehicle), armed with two *Maschinengehwehr* 34 in a *Zwillingssockellafette* (twin mount). (Anderson)

Engineers have opened the transmission cover plate to inspect the susceptible steering brakes on a *Sturmgeschütz* Ausf B from StuGAbt 190. The two-piece cover also served as an escape hatch for the driver. Note that the aperture for the *Rundblickfernrohr* gun sight has been covered with a steel plate, which suggests that a *Selbstfahrlafette-Zielfernrohr* (Sfl-ZF) 1 has been fitted. (Anderson)

In October 1941, the command of the 4.Army reported:

> To the Commander-in-Chief of PzGr:4
>
> In the last few days we have repeatedly been fighting heavy and super-heavy tanks, which cannot be defeated by normal anti-tank defences, and also le FH [10.5cm le FH 18]. Quite naturally, this delays any attack by our infantry. For this reason, I wish the following countermeasures to be taken instantly:
>
> a.) Single light artillery guns have to be deployed in the front line of our attacking or defending infantry.
> b.) Single guns from 10cm batteries and 8.8cm FlaK have to be deployed in a similar way so that they can intervene quickly in the fight.

This note shows that anti-tank weapons for the infantry divisions were unable to cope with the new danger, and also that *Sturmgeschütz* or *Panzers* were not available in sufficient numbers. The deployment of slow-to-move field guns or *Flugzeugabwehrkanone* (FlaK) guns in the front lines is proof of the dilemma facing the German army at this critical time. Only the superior battle tactics of the Germans, compounded by the relative tactical and strategic inability of the Soviet defenders, avoided a collapse of the assault.



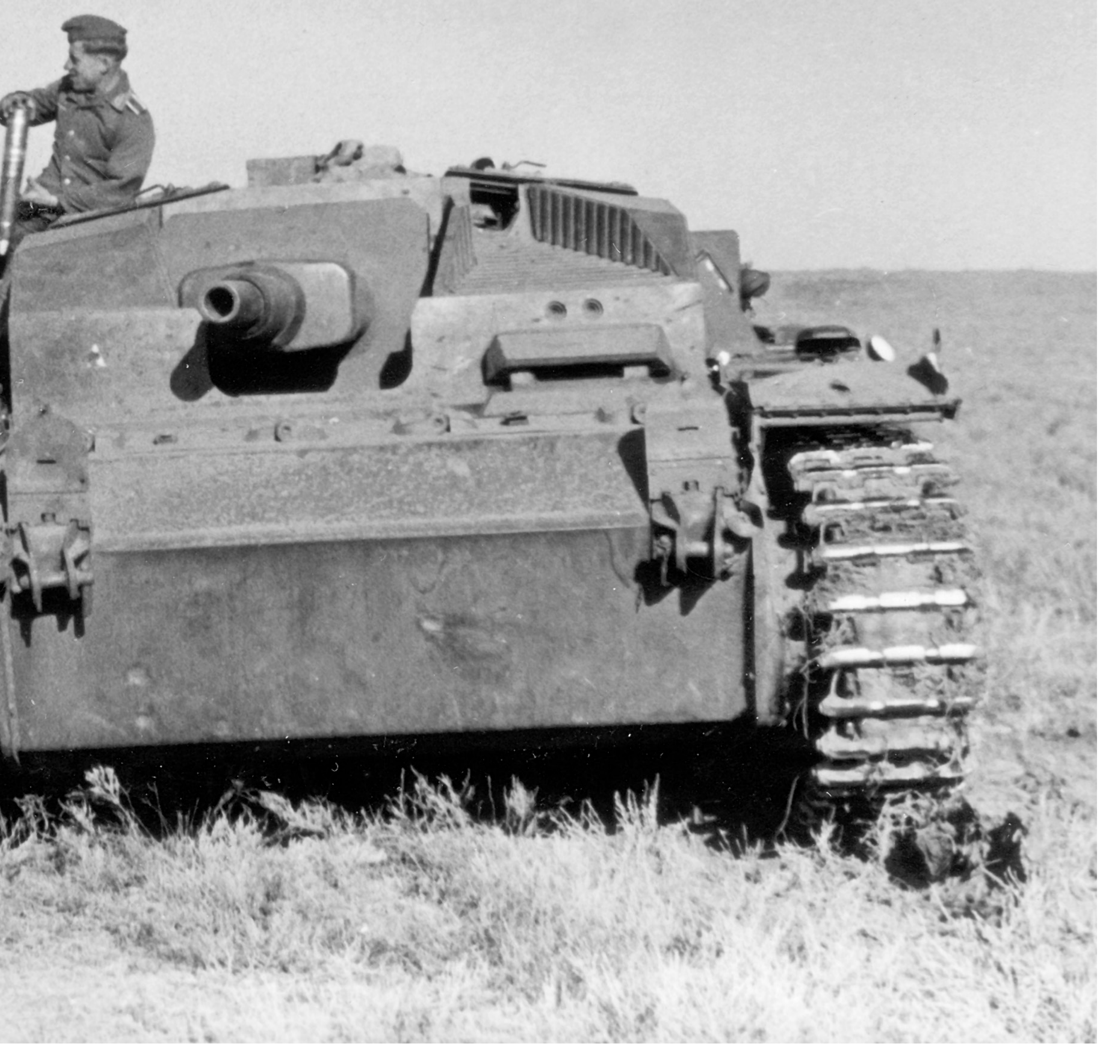
Battlefield Performance

The first PzKpfw IV and the *Sturmgeschütz* mounted the same weapon, designated 7.5cm *Kanone* (K) L/24 or *Kampfwagenkanone* (KwK) in the PzKpfw IV, and *Sturmkanone* (StuK) in the *Sturmgeschütz*. The short-barrelled gun was originally designed as a support weapon, but had a low muzzle velocity requiring it to be fired at a high trajectory as targets were to be attacked by 'bracketing'. When compared to the more rapid-firing anti-tank guns, the accuracy of the 7.5cm gun was poor.

The fighting in the east quickly established how important it was for the *Sturmgeschütz* to fight against enemy tanks. Initially, only two types of 7.5cm ammunition suitable for this role were available.

7.5cm PzGr Patr

This solid-shot round with explosive filling penetrated the armour and detonated inside the enemy tank, eventually destroying the vehicle by



A *Sturmgeschütz* Ausf B of StuGAbt 190 being replenished with ammunition from an SdKfz 252. The gun has been fully-traversed to the right, possibly to allow easier access to the ammunition racks in the fighting compartment. (Anderson)

igniting ammunition or fuel. The penetration performance was affected by the muzzle velocity and the ballistic characteristics of the shell. As previously mentioned, the low velocity 7.5cm PzGr Patr penetrated 41mm of armour at 100m and 34mm at 1,000m range, making it ineffective against the latest Soviet tanks.

7.5cm Gr Patr

The standard high-explosive (HE) round was very effective in combat against even the T-34 medium and KV-1 heavy tank. Although the shell could not penetrate their armour, the explosive impact of a well-aimed shot could cause the turret to jam or damage suspension and disable the tank.

However, as growing numbers of these modern types began appearing on the battlefront, German forces had to accept the relative ineffectiveness of their tank and anti-tank guns. A report dated September 1941, published by the Inspector General of the Army, details the performance of the 7.5cm PzGr KwK (StuK) L/24, firing a standard anti-tank round:

Left: A crew member of a *Sturmgeschütz* passes a 7.5cm round up to the loader before it is stowed inside the vehicle. In combat, ammunition was supplied by a SdKfz 252 towing a SdAnh 32 trailer, which was difficult to reverse; a manoeuvre which often caused the towing bar to break. (NARA)

> Combat experiences against the Russian 25t tank – PzKpfw T-34
>
> Attacking with 7.5cm PzGr KwK:

Front:	Due to the low angle of impact any fire results only in minor, hindering, damage. A direct hit on the front of the turret can, on some occasions, penetrate the armour.
Turret and superstructure side:	No penetration at any range
Lower hull side:	Clear penetration at any range
Turret and hull rear:	No penetration at any range.

A Technical Solution

The poor anti-tank performance of the 7.5cm KwK/StuK L/24 was finally accepted. Although work on a new, more powerful long-barrelled 7.5cm gun had already begun, a short-term remedy was requested for the estimated 800 tanks (PzKpfw IV and *Sturmgeschütz*) already in service by autumn 1941.

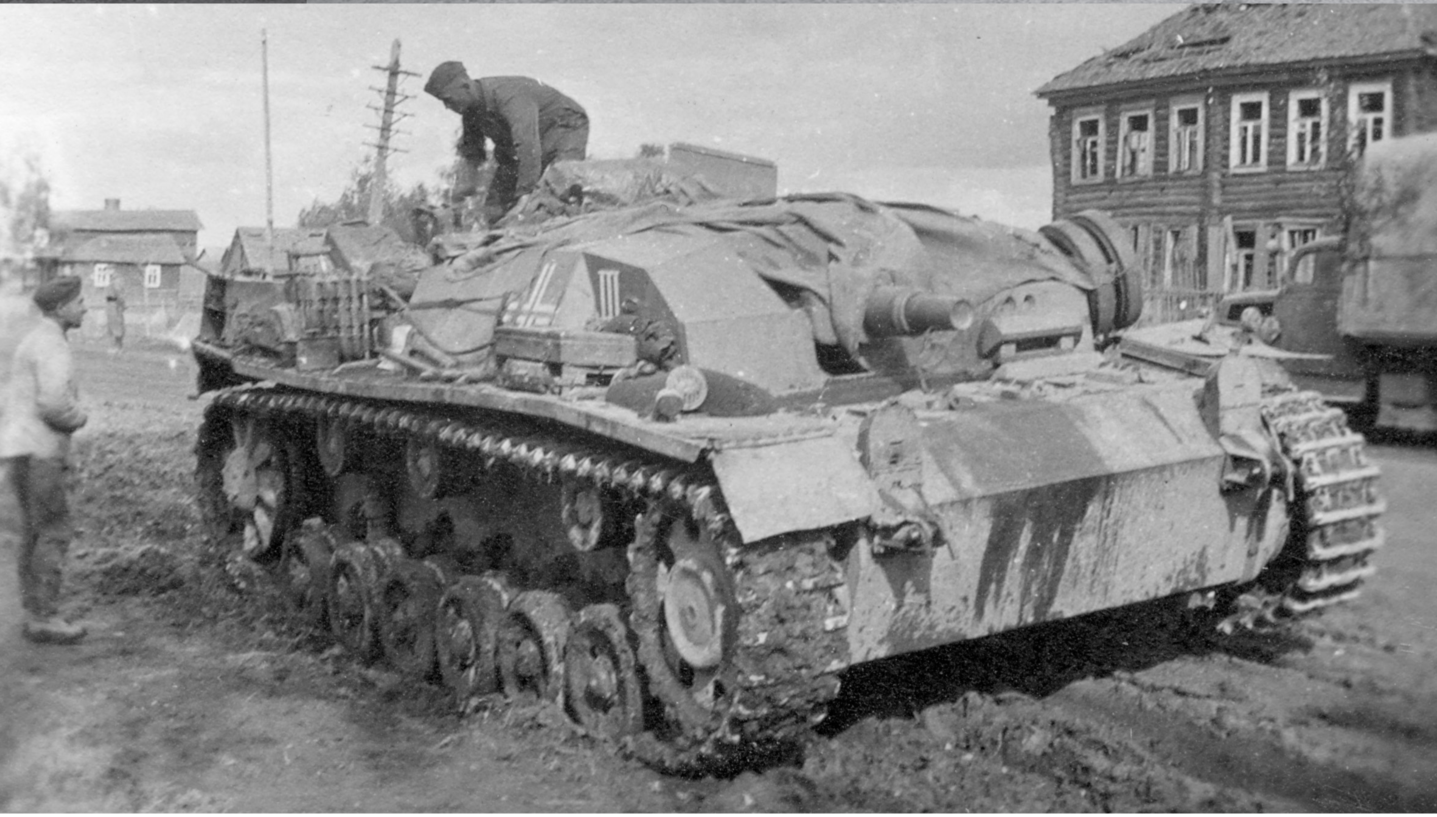
The armour piercing performance of the 3.7 and 5cm KwK tank and anti-tank guns could quickly and effectively be improved by the introduction of tungsten-core ammunition, designated as the PzGr 40, sometimes referred to as *Sondermunition* (special ammunition) by the troops. Unfortunately, the scarcity (and the high cost) of tungsten in the Reich allowed only a limited supply of this ammunition.

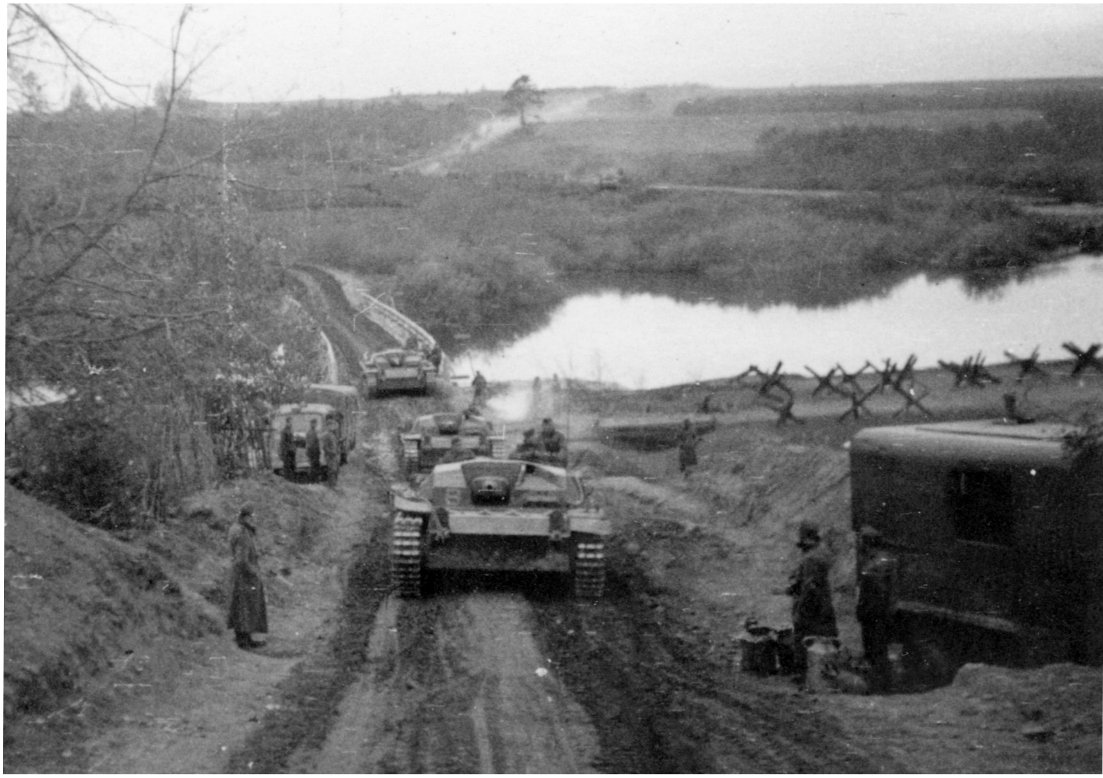
The use of tungsten-core ammunition for the 7.5cm KwK/StuK was considered wasteful due to the low muzzle velocity of the gun and its lack of accuracy. A different approach had to be sought. The Austrian explosives pioneer Franz Rudolf Thomanek had for many years been developing special destruction devices based on the Munroe/Neumann-type shaped charge.

The principle of this method is as follows: when a shell hit the armour, the explosive impact punched a conical-shaped hole allowing hot gas propelled shrapnel to enter the target. The shock wave generated and the metal splinters would have a devastating effect on the crew.

German engineers developed *Hohlladung* (hollow-charge) ammunition, but the exact date of its introduction remains unknown. On 12 December 1941, *Heeresgruppe Mitte* reported:

> The *Führer* has authorized the usage of the *Hohlraum-Geschosse*: 10cm *Granate rot* [red] for le FH 18 and the 7.5cm *Granatpatrone* 38 for KWK.





Above: A battle-worn *Sturmgeschütz* of StuBttr 667 on the Eastern Front during autumn 1941. This vehicle is an Ausf A, with the drive sprocket modified to fit the wider 40cm track. The Roman numeral III denotes 3.Zug; the small numeral denotes the vehicle's number within the *Zug*. (Anderson)

Right: Three *Sturmgeschütz* Ausf B from StugAbt 210 pass trucks of a command unit during their advance to support front-line forces in their next attack. (Munch)

Apparently there was some initial confusion about the new round. Before it was officially designated 7.5cm GrPatr 38 HL, it was given other designations such as *Hohlraumgranate* (hollow-charge shell), GrPatr AZ 38 or simply 7.5cm *Sondermunition* (special ammunition).

Performance figures for this new ammunition were detailed in a document dated December 1942, stating that with a muzzle velocity of 450mps, 70mm of armour was penetrated at all ranges. The document also notes that the 7.5cm PzGr (*rot*) was no longer used.

In 1942, an improved version was introduced, which could now penetrate 75mm of armour at the same muzzle velocity. This round was designated 7.5cm Gr 38 HL/B: the older type of shell was now referred to as HL/A.

Panzerregiment 33 answered a 'questionnaire for *Panzer-Regimenter*' dated 2 February 1942:

> The total ineffectiveness of the 5cm and 7.5cm *Panzergranate* began to have a demoralizing effect on the tank crews … The effectiveness of the 7.5cm *Sondermunition* is good.

This assessment is not really helpful. In March 1942, the *Oberkommando* of 9.Army conducted test firings of armour-piercing weapons at Rzhev [in occupied Russia]:

> Weather: Sunny, minus 12 to 15°C.
>
> *Sturmgeschütz* with 7.5cm KwK:
>
> a) KV-2, side, angle of impact approximately 45°; range 150m:-
> Three PzGr, two GrPatr with AZ 23, three GrPatr with AZ 38 (shaped charge) – all hits
> Effect:
> Turret jammed, only little further damage
> b) T-34, side, angle of impact approximately 60°; range 70m:-
> Four GrPatr AZ 38 – all hits
> Effect:
> Front idler wheel destroyed, track damaged.
> c) T-34, front, 80m range:-
> Three GrPatr AZ 38 – all hits
> Effect:
> One penetration of the turret, driver's hatch and turret hatch were blown off. Two rounds entered the interior through the open hatch. Tracks slightly damaged. Two rounds ricocheted off the sloped front.
> d) KV-2, front, range 80m:-
> Four GrPatr AZ – Two hits, but two rounds detonated by thin overhead branches.
> Effect:
> One hit ripped off the driver's vision visor, and one round clearly ricocheted off.

The almost complete *Sturmbatterie* 667: five *Sturmgeschütz*, one SdKfz 252, two SdKfz 10s (with ammunition trailers) and two SdKfz 11. The men are taking advantage of a lull in the fighting by bathing themselves and washing the vehicles in the shallows of a Russian river. (Anderson)

> Summary:
> The tanks would have been immobilized by the fire from the *Sturmgeschütz* gun. The rounds entering through the open hatch would have destroyed the tank. We recommend fire be directed at the hatches and the suspension.

Although the summary points out that combat against the latest Soviet tanks was possible with the 7.5cm StuK, this report is really an admission of weakness. The fact the experiments were using ranges of only 80 to 150m is relevant. Even using 7.5cm *Sondermunition*, (GrPatr 38 HL), an overall sweeping success was not achieved. All the ranges used were well inside the effective range of the Soviet 76.2mm tank gun.

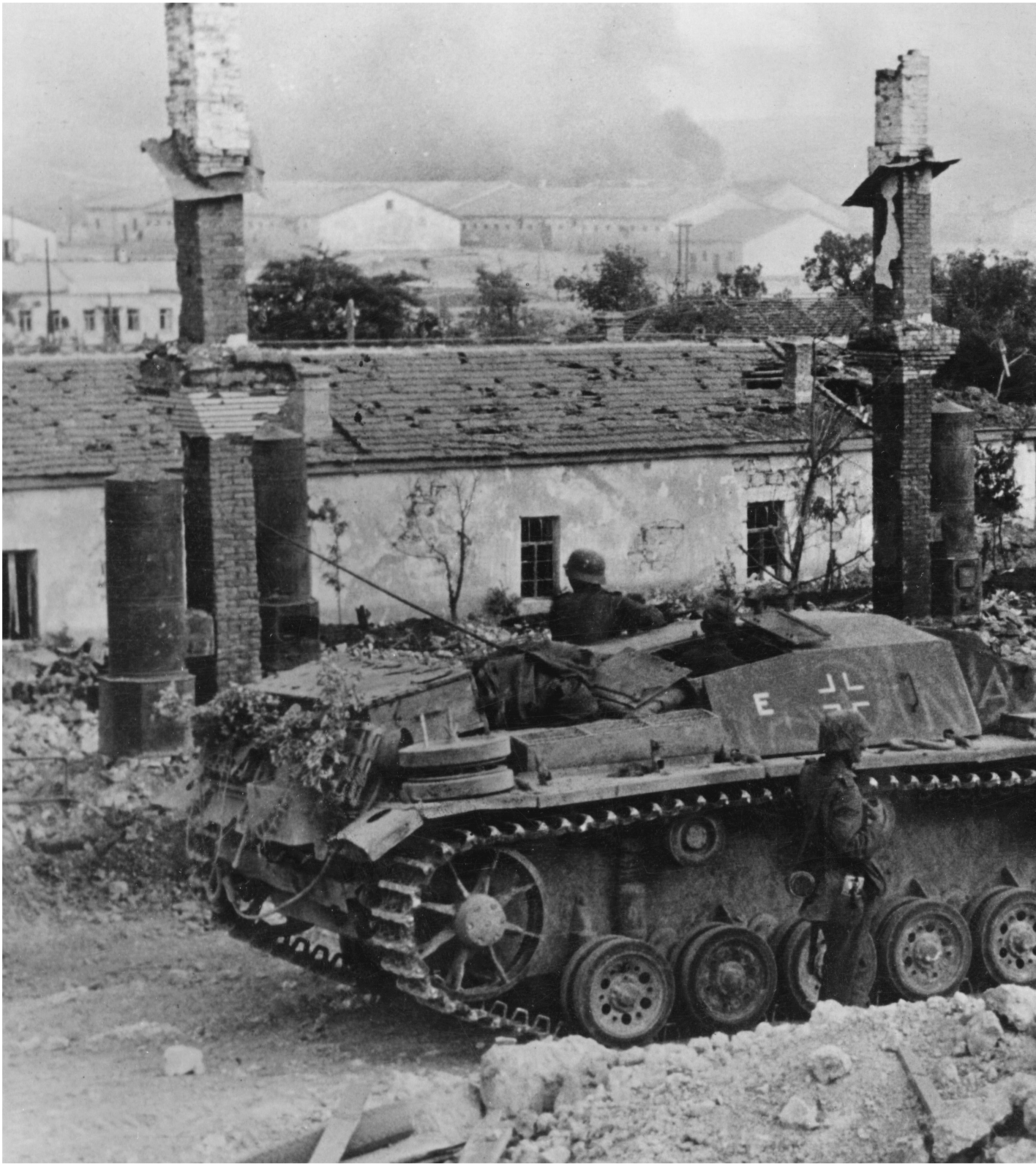
However, it is obvious that these shortcomings were solved by the introduction of the GrPatr 38 HL/B. This is noted in a report from StuGAbt 244 after the fighting around Kharkov and Minsk in early summer 1942:

> Both the extent and importance of the battle that surrounded Kharkov justifies the preparation of a separate experience report. It will be of special interest due

> to the fact that it deals with an experienced *Sturmartillerie*-unit which has been in *Ost-Einsatz* (combat in the east) for over a year with the new equipment according to the new KStN.
>
> I.) Success report
> Enemy tanks destroyed or captured by StuGAbt 244 during the period from 13 May 1941 to 14 June 1942. The data in brackets denote the further successes during the encirclement battle of Kharkov: 100 (86) medium and heavy tanks.
>
> II.) Own losses in the period 12 to 28 May 1942:
>
> a.) Total losses due to enemy action
>
> PzSfl (III b) (SdKfz 142)
>
> | | |
> |---|---|
> | new equipment | 2 |
> | old equipment | 3 |
> | mLkw Ford V8 | 1 |
> | l gelPkw *Volkswagen* | 1 |
>
> b.) Temporary breakdowns due to enemy action or by premature wear and tear, which have been repaired by the *Abteilung*'s workshop platoon.
>
> | | |
> |---|---|
> | Medium motorcycle | 3 |
> | Heavy motorcycle | 13 |
> | Tanks | 5 |
> | Medium halftracks | 15 |
> | Trucks | 16 |
> | SdKfz 252 | 4 |
> | SdKfz 9 | 4 |
> | SdKfz 142 (StuG) | 18 |
> | SdAnh 32/1 | 1 |
>
> III.) Personal losses:
>
> | | |
> |---|---|
> | a) Killed in action | 8 |
> | b) Wounded | 30. |

This report reveals some interesting details. During the battle of Kharkov it notes that German forces lost five tanks and 18 StuGs (over 50 per cent were repaired) against 86 destroyed or captured Soviet tanks. German losses are surprisingly low, as they were fighting off attacks by T-34s and the formidable KV-1 and KV-2 heavy tanks. The report continues:

> 3. Combat against enemy tanks:
> The *Abteilung* was faced with far superior numbers of enemy tanks. The majority of these tanks were stronger armour, were more mobile and had better guns (higher muzzle velocity).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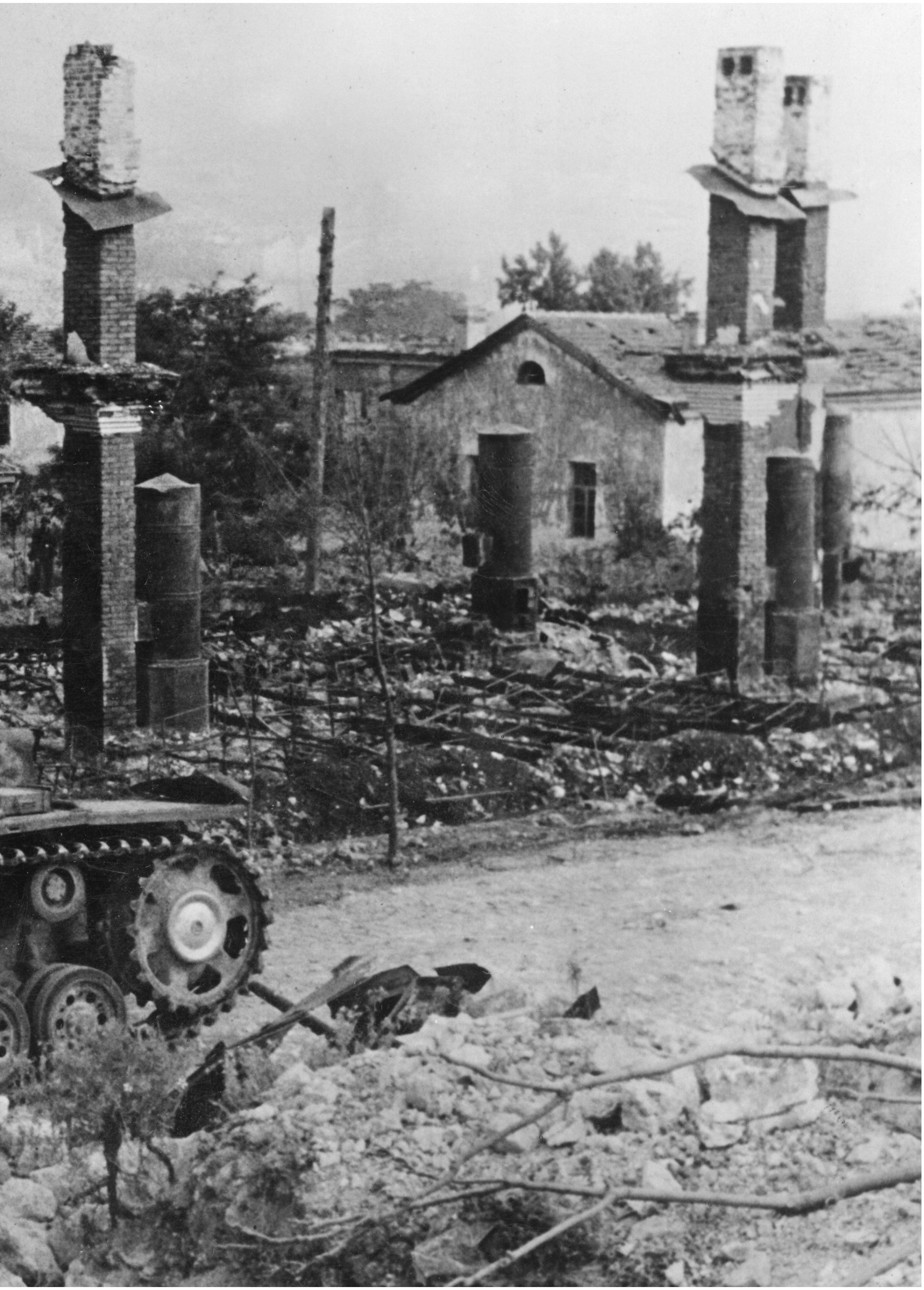
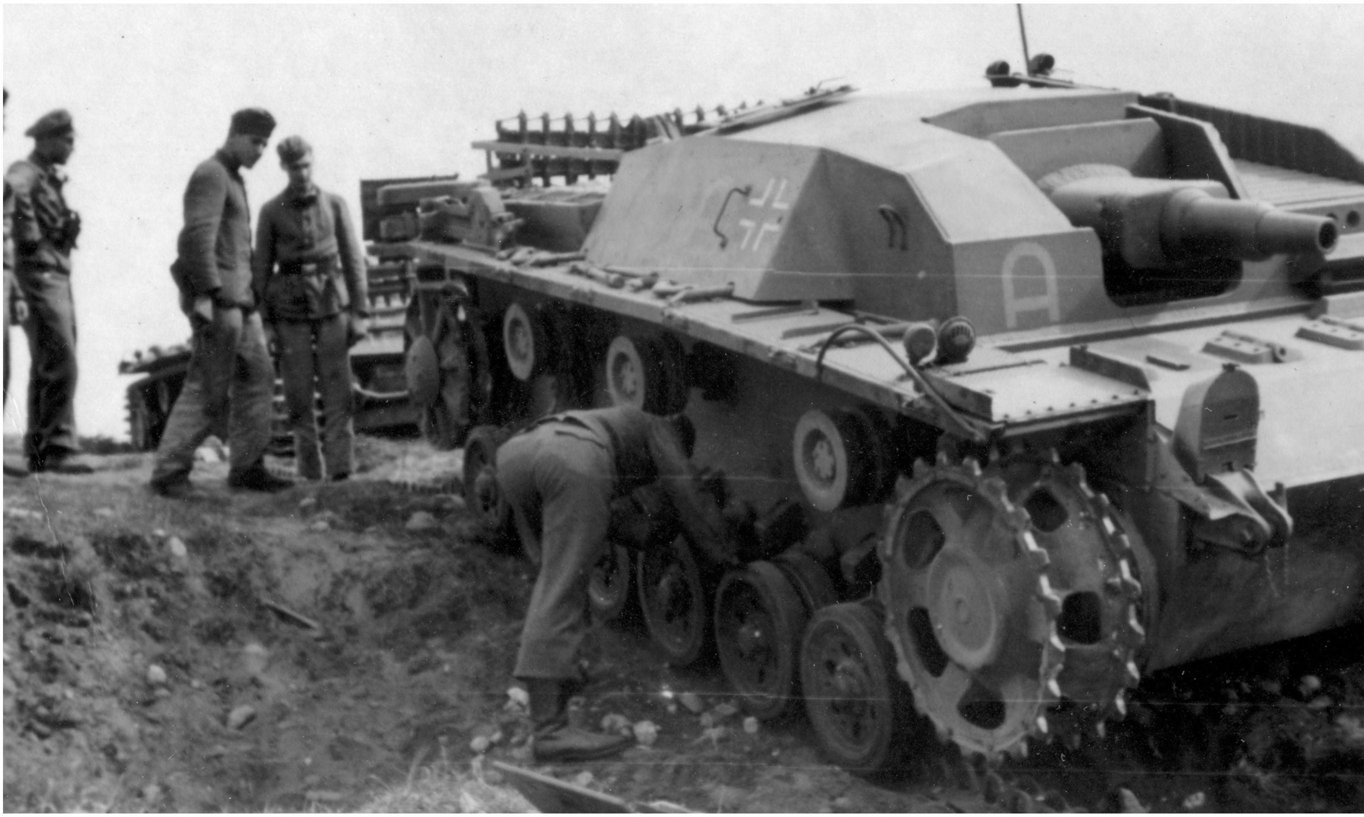


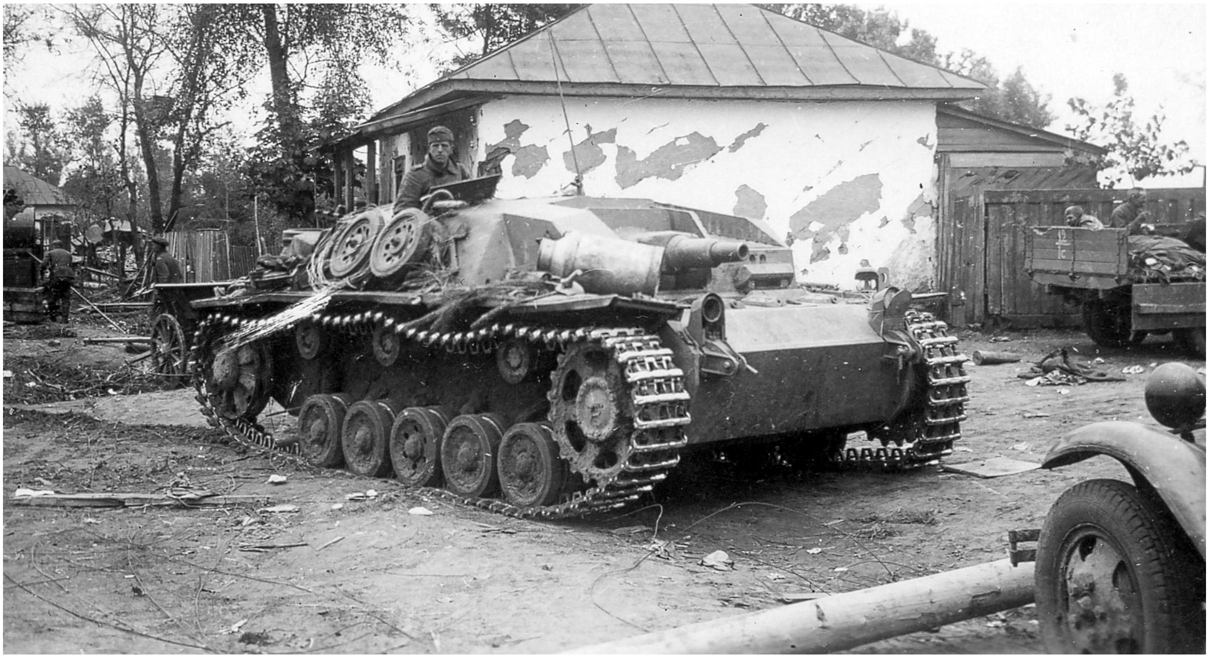
A *Sturmgeschütz* moves through a scene of devastation in Russia. The narrow roadway places the vehicle in dangerous position as it has to manoeuvre to fire; or it could be open to attack from an enemy sniper or anti-tank team hiding in the ruins. (Getty)

> The main Soviet combat tactic was to use a massed deployment and the terrain to their best advantage. The *Abteilung* experienced extraordinary success during the first two days (13 and 14 May), when in many cases just an appearance by a *Sturmgeschütz* caused the enemy to turn away despite being superior in numbers. The interrogation of the commander of 148 Tank Brigade, Major General Michailov, deserves attention. He explained that his brigade had been heavily attacked primarily by *Sturmgeschütz*. The enemy considers our combat tactics more agile and our weaponry as more precise.
>
> Actual combat against enemy tanks. For the *Panzer-Sprenggranate* 38 the most favourable combat range was between 300 and 700m. The best results were achieved by hitting the joint between the turret and superstructure; the rear section containing the engine and fuel tanks; the drive train and suspension.
>
> The 3.*Batterie* noted: The *Panzer-Sprenggranate* 38 has performed well in its first use in combat against enemy tanks. The round must have a true penetrating ability, leaving only a small hole of 2 to 3cm diameter in the armour. Inside the tank, the very high heat it generated ignited everything within a short time.

This report shows that the new ammunition was available, and its usage in combat against the T-34 and KV-1 and KV-2 was promising. It should be noted that most German tanks of the time had better observation means (this was not the case with the early *Sturmgeschütz*) and excellent radio equipment.



A *Sturmgeschütz* from StuGAbt 210 being recovered after striking a buried mine: a constant hazard which invariably left the disabled vehicle as an easy target for enemy anti-tank gunners. (Anderson)



Although combat ready, this *Sturmgeschütz* Ausf B of StuGAbt 191 has lost a running wheel possibly by a hit from an anti-tank rifle. If the track became loose then steering the vehicle would become very difficult, or, even worse, the track could come off the sprockets forcing it to stop. The unit has captured two Soviet trucks to improve transport requirements. (Anderson)

The rapid advance during the first months of Operation *Barbarossa* placed a great strain on both men and material. Two months after the beginning of the campaign, StuGAbt 203 reported the loss of only one *Sturmgeschütz*. The commander, however, claimed in his report, dated 14 August 1941:

> Regarding personnel, the *Abteilung* is ready for combat. As for the material, only 33 to 66 per cent of its strength is in operational condition, since all engines in the StuGs have passed their in service time. Full combat readiness can only be achieved by the delivery of new engines.

By October, both StuGAbt 184 and 210 submitted similar status reports, requesting general overhauls for their *Sturmgeschütz* which were expected to take four to five weeks to complete.

The war diary of 2.Bttr/StuGAbt 201 unveils the numerous problems tank crews had to face in combat. Mechanical failure or minor damage could lead to the sudden end of a mission:

> 27 September 1941
> We receive ammunition. In the afternoon, at 15:00hrs, we leave Smolensk for our destination, the forest camp of 2.Bttr/StuGAbt 201. Already during the advance our *Sturmgeschütz* fails due to steering brake failures. It takes two days to repair and reach the workshop of StuGAbt 201.
> 2 October 1941
> Our mission: Eliminating isolated pockets of resistance supported by enemy tanks. All of a sudden we are faced by a T-34 which appears at a range of 80m.

> The firing mechanism of our gun fails. The Russian tank sees us and trains his gun on our position. We quickly reverse and hide behind a house and attempt to fix the problem. The Russian tank follows and fires at us. We use our radio to alert the other *Sturmgeschütz*. We drive back, now pursued by two Russian tanks to our jump-off position. Our companion *Sturmgeschütz* follows and succeeds in destroying the T-34s.
> 3 October 1941
> Our *Sturmgeschütz* had a loose contact in the firing mechanism: a simple but annoying problem which can easily be fixed by the workshop.
> 4 October 1941
> The following morning we carry on our advance, but in a different direction, and then become stuck in a marsh. Our brakes and steering mechanism are completely clogged and have to be dismantled and thoroughly washed with oil. This causes a delay of three hours.

Modifications

The mechanically vulnerable Maybach Variorex transmission was replaced by a new more reliable ZF SSG 77 transmission built by Zahnradfabrik Friedrichshafen, a subsidiary of Maybach. Of similar importance were the changes to the radio equipment. The Ausf A was fitted with the Fu 15 radio, while later production versions carried the Fu 16 radio. This set consisted of a receiver and a transmitter allowing two-way contact, a great improvement. The *Sturmartillerie* now had the same high-quality communications equipment as the tanks of the *Panzertruppe*.

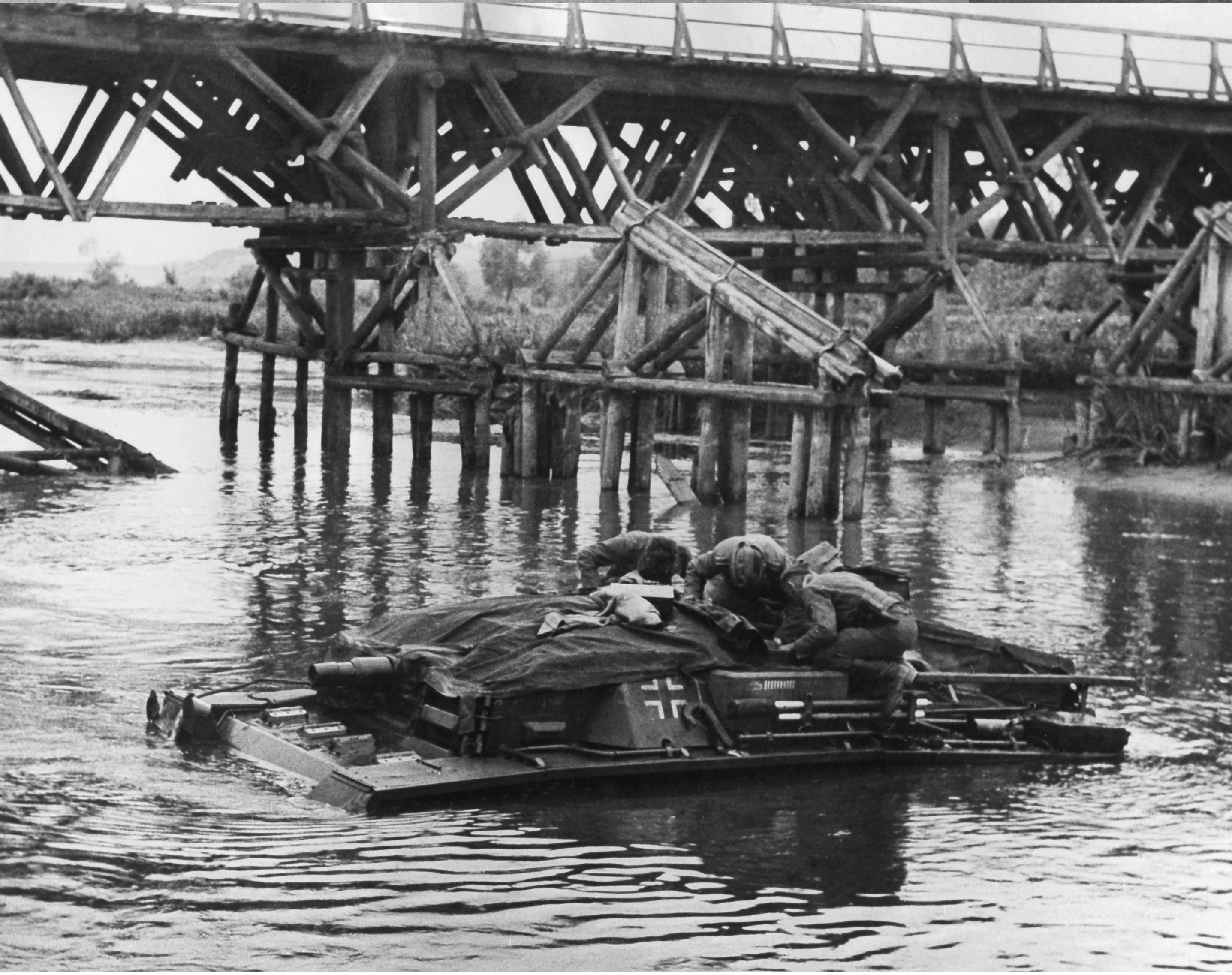
In April 1940, the Ausf C entered service and had improvements made after front-line experience. The small aperture for the gunner's telescope, in the left front of the casemate was deleted. The *Rundblickfernrohr* (RblF) 32 periscope sight was replaced by a *Selbstfahrlafette-Zeilenfernrohr* (Sfl ZF) 1, which had a longer tube allowing it to protrude through an aperture in the gunner's escape hatch.

After 50 Ausf Cs had been built, the production order was increased, and was followed by the basically identical Ausf D. By August 1941, a total of 150 *Sturmgeschütz* Ausf Ds had been built.

Improved Command Capability

With the introduction of the *Sturmgeschütz* Ausf E a major step was taken to improve the design.

The battery and platoon commanders relied on their SdKfz 253, which had sufficient space for both Fu 15 and Fu 16 radios (two receivers and one transmitter). However, the mobility of the light halftrack in rough terrain was severely restricted, and the poor level of protection for the crew did not allow it to operate in forward positions. However, after the first battles this was regarded to be of great importance and it was decided to modify the *Sturmgeschütz*. To store the radio equipment it was necessary to enlarge the interior space of the *Sturmgeschütz*. While the chassis remained practically



During the rapid advance many bridges were encountered which were not strong enough to carry heavy vehicles and rather than halt the advance, attempts were made to ford the river. A *Sturmgeschütz* awaits recovery after becoming flooded during such a crossing. (Getty)

unchanged, the superstructure was fitted with larger armoured pannier boxes on each side (earlier versions had only a small pannier box on the left). Command tanks were fitted with two fixed (non-collapsible) antenna. There was now no need for the dismount forward observer in the SdKfz 253 and the *Tornisterfunkgerät* h (TornFuG h) field radio.

As with the earlier versions, regular platoon vehicles retained the Fu 16 radio with one antenna. Due to the new pannier box on the right-hand side, these vehicles could carry a further six 7.5cm ammunition rounds. In case of an emergency, the conversion to a command tank was simple process, an Fu 15 radio set could be easily installed.

An initial order for 500 *Sturmgeschütz* Ausf E was placed, and production began in September 1941. By the end of the year, a total of 540 *Sturmgeschütz* had been completed.

F

1942: to the Gates of Stalingrad

5

On 22 June 1941, German forces launched three very ambitious armoured thrusts deep into Russia with the aim of taking Leningrad, Moscow and the Crimea before the onset of winter.

By early September 1941, German forces had established a front line from Novgorod in the north to Zaporozhye in the south, but the *Rasputitsa* (quagmire season) had taken a heavy toll on the advancing forces; men were exhausted and heavy equipment required servicing or replacing. When the Russian winter arrived, deeply sub-zero temperatures caused even more problems. German military planners had not foreseen these and everything from winter clothing for their troops to anti-freeze fluid for the vehicles was in short supply. To make life even more difficult on the battlefront, Soviet forces put up an unexpectedly resolute defence of their territory.

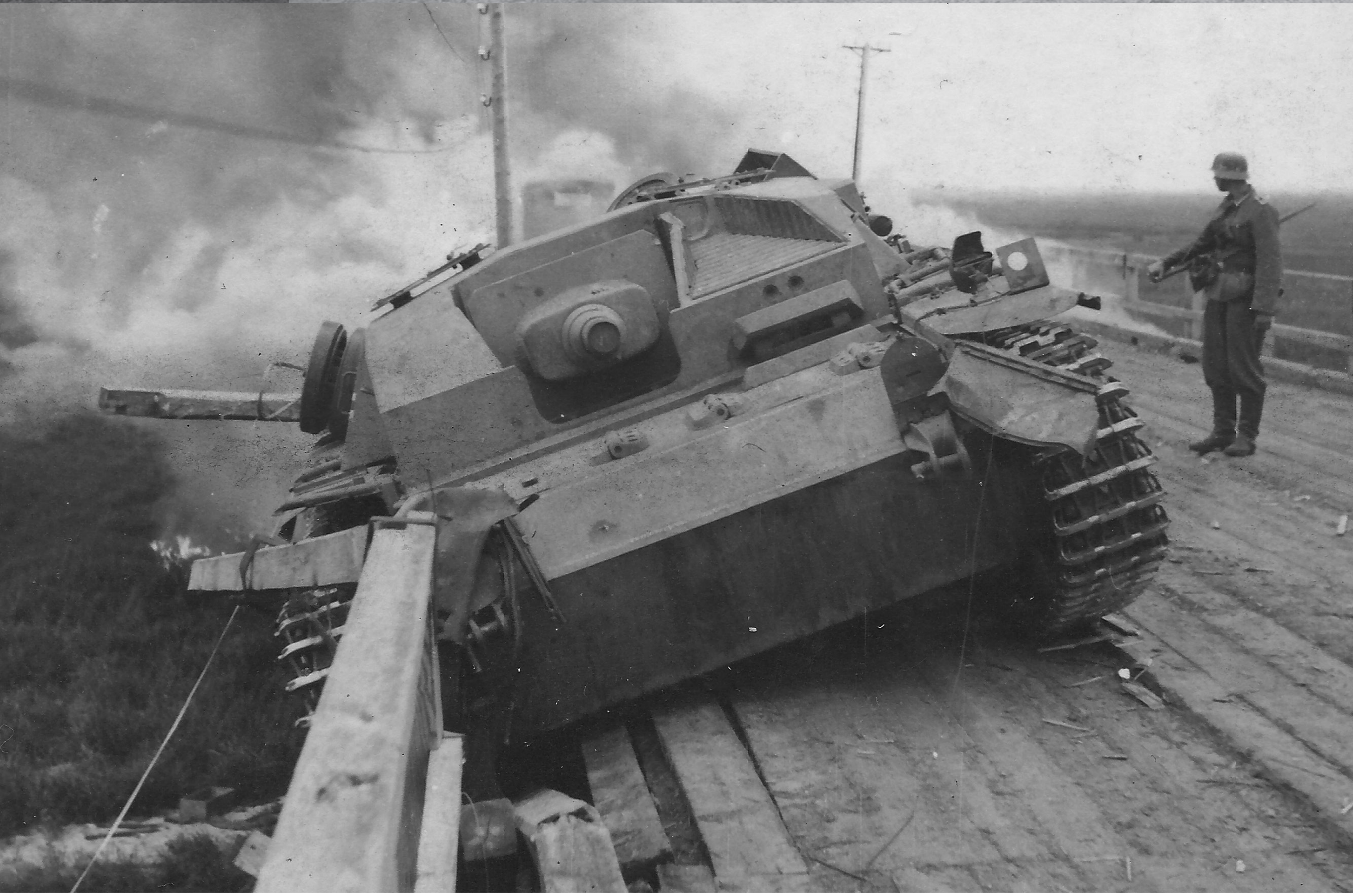
Under these extreme conditions, German forces continued a slow advance further to the east. By December 1941, Leningrad had been almost surrounded, while Belgorod and Rostov had been reached, and German units, *Sturmgeschütz-Abteilung* (StuGAbt) 201 and 210 among them, had reached positions some 30km to the west of Moscow.

On 5 December, the Russian winter worsened when the temperature fell to minus 30°C. The Red Army launched a counterattack on the Moscow front which almost instantly forced the already weakened German forces to fight defensively and withdraw to new positions.

In early 1942, StuGAbt 185 submitted a very thorough after-action report dealing with its experiences during the period:

> Winter experience during fighting on the Volkhov front:
>
> At the end of October, three new *Sturmgeschütz* with crews were assigned to the *Abteilung*. These vehicles, although not requested, were fitted with up-to-date equipment and proved to be most valuable for winter combat.

Infantry followed by a *Sturmgeschütz* Ausf F *Langrohr* of StuGAbt 210, advance through the dense woodland (ideal for enemy anti-tank teams) of the Kuban Oblast towards Krasnodar, southern Russia. German forces occupied the city on 12 August 1942, but it was retaken by Soviet forces on 12 February 1943. (Getty)



Across the Russian countryside many bridges were constructed from wood and capable of carrying local traffic, but not the weight of heavy armour. A *Sturmgeschütz* Ausf B of StuGAbt 177 has broken through a wooden bridge and will have to be recovered by the pioneers. If this could not be achieved, then the vehicle would be destroyed to prevent it falling into the hands of the enemy. (PeKo)

On 17 November 1941, the *Abteilung* was ordered to march to the positions of 16.Army where it was to support infantry assaults by *Gruppe Wolchow* [Group Volkhov].

The march was estimated at 300km and began in temperatures of minus 15°C. Only a few vehicles had anti-freeze protection suitable for below minus 12°C in the cooling system. Only a third of the *Sturmgeschütz* were provided with ice cleats [track spuds]. However, enough snow chains were for available for the halftrack and soft-skinned vehicles.

As a precaution, the *Abteilung* had sent some trucks back to the Reich at the beginning of November to pick up the missing ice cleats, and also a sufficient supply of 'Glysantin' [anti-freeze fluid].

The first 200km of the march were covered on good roads… When camped at night temperatures fell to minus 28°C, which required all engines to be started every 30 minutes. The motorcycles were garaged in our heated quarters.

During the final 100km, dreadful road conditions, which no one would have considered passable, were encountered. During autumn, the dirt roads became completely rutted by the tracks of our tanks. After the onset of frost was followed by heavy snowfall, these roads became the most difficult obstacles. Furthermore, they were so narrow that only one *Sturmgeschütz* could travel at a time. On the west bank of the river Volkhov, only one bad road was available; all bridges had been blown up and the ice on the river was too thin to drive over.

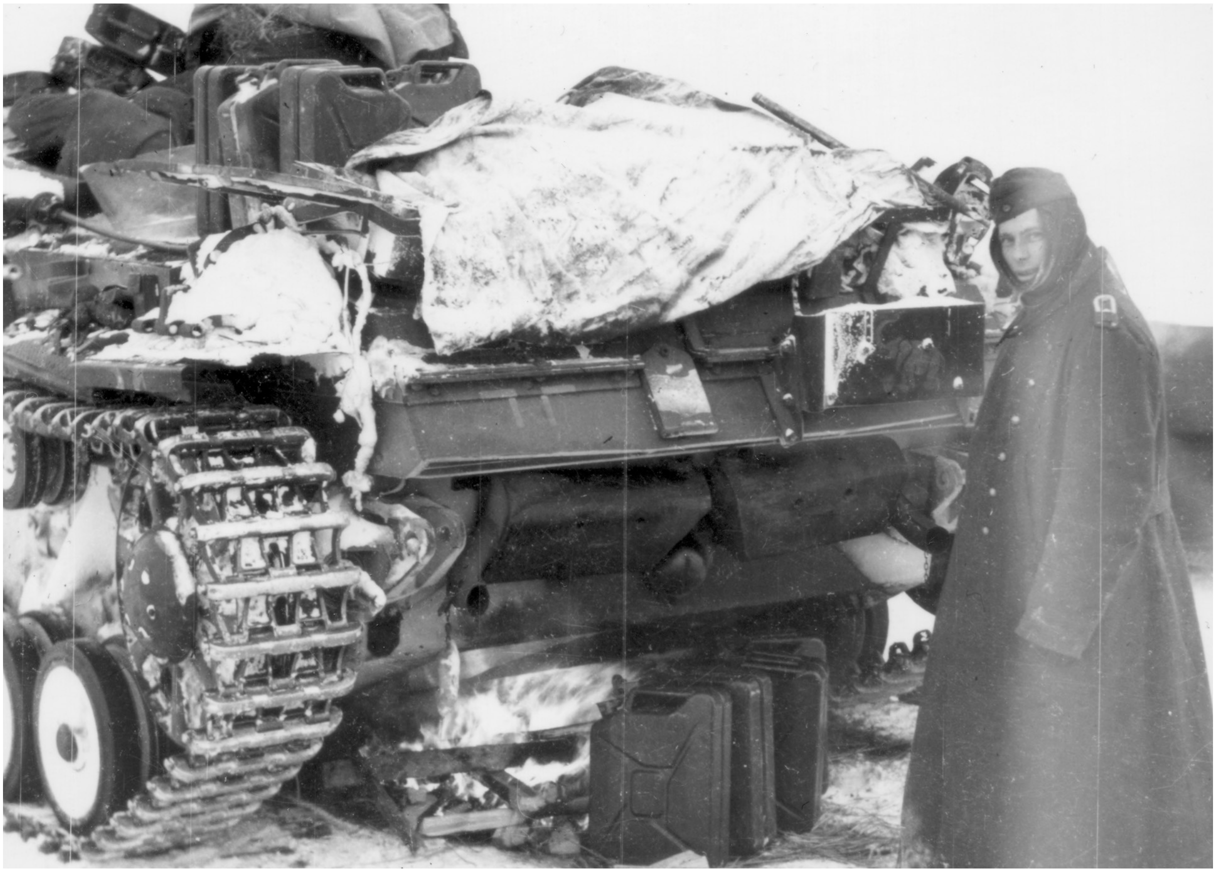
The motorized vehicles caused many, if only temporary, problems. The *Sturmgeschütz* suffered badly; the conditions caused tracks to slip off their sprockets or they broke. It took the *Abteilung* three days to cover the 100km.

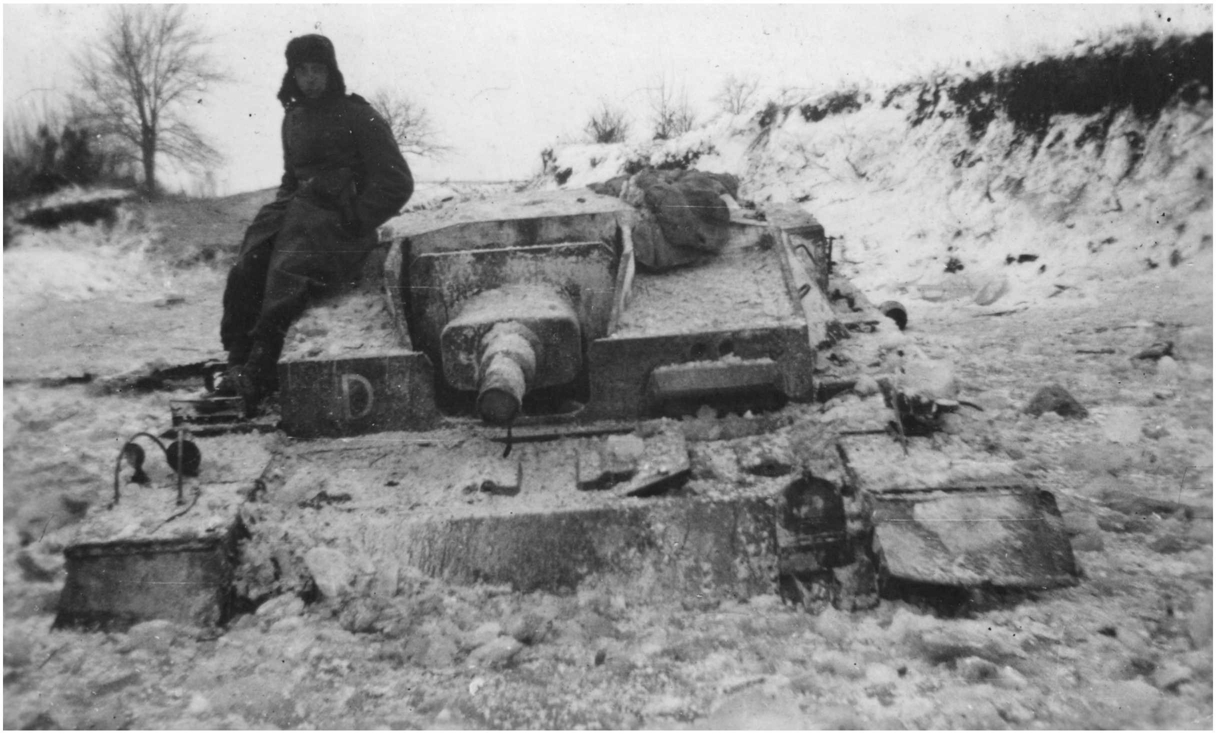
By employing all means, the *Abteilung* was able to mobilize four out of eight *Sturmgeschütz* in each battery… The repair works, carried out in the open at temperatures of minus 30°C led to a number of engineers suffering serious frostbite.

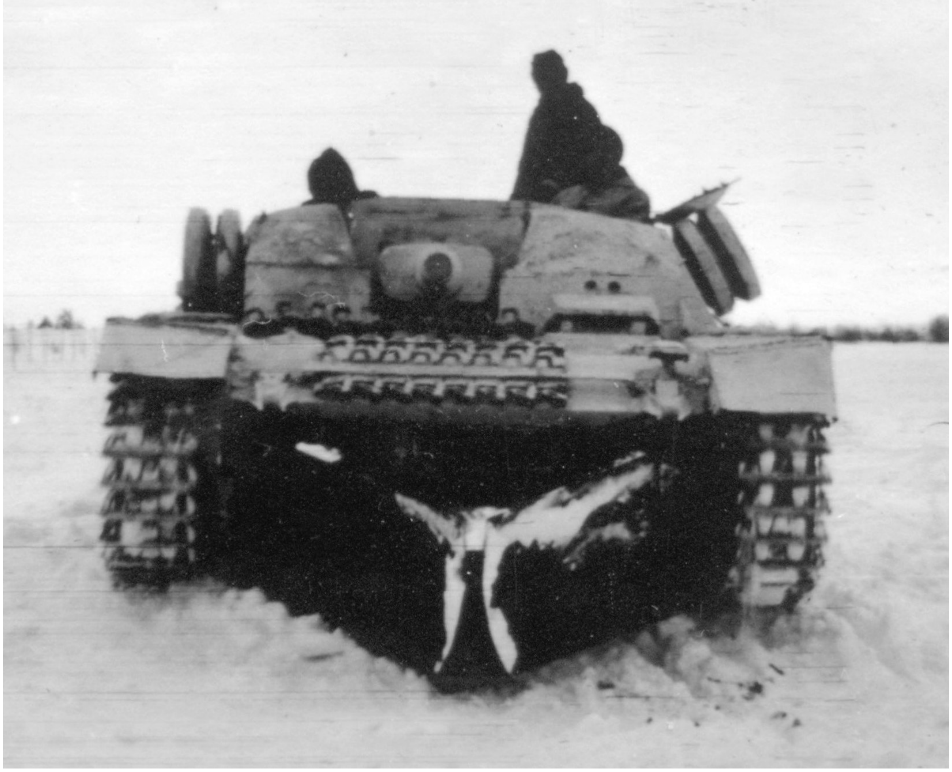
Combat took place over narrow forest tracks with deep ditches on both sides. Despite a number of vehicles slipping off these tracks, the infantry assault was a success and their given objective was reached relatively quickly.

A special problem caused by snowfall was the detection of minefields… One *Sturmgeschütz* struck a new type of Soviet mine and the very powerful explosive impact resulted in a total loss. The commander and loader were thrown 12m clear of the vehicle, but the driver and gunner were trapped; no help was possible in the resultant fire.

The extreme freezing conditions experienced in December 1941 became a critical problem for men and vehicles. Grease, oil and other fluids would freeze or turn viscous and engines would not start. In a temperature of minus 45°C, a member of a *Sturmgeschütz* crew, from StuGAbt 203, has lit a fire under the rear of the vehicle to heat the engine compartment. (Anderson)







Above: A *Sturmgeschütz* Ausf C or D of StuGAbt 245: tanks could cross frozen streams if the ice was thick enough, but this would have to be carefully assessed by the crew. (Anderson)

Right: A *Sturmgeschütz* of StuGAbt 185 fitted with a *Schneeräumer* (snow plough). The device was not a clearing blade, but was designed to push loose snow under the tracks where it would be compressed to make a hard track for any following vehicles. Note, the sloping armour on the front of the superstructure has been reinforced with concrete as an attempt to eliminate bullet traps. (Anderson)

A dark grey tank on a white snow-covered battlefield made an easy target for Soviet gunners. Here a crew member attempts to camouflage a *Sturmgeschütz* of StuGAbt 245 by brushing on a coat of whitewash paint. (Anderson)

Due to an increasing number of transmission and starter motor failures, torsion bars breaking and many other mechanical problems, the recovery section was occupied throughout the day and night. Despite the repair work, the number of combat ready *Sturmgeschütz* decreased day by day. On 10 December, only five *Sturmgeschütz* were available which were combined into a battery, while the remaining unserviceable vehicles were loaded onto railway wagons. When a number of ZgKw [halftrack vehicles] were lost due to enemy fire, the recovery of two immobilized *Sturmgeschütz* became impossible and both had to be destroyed as the enemy advanced. A short time later, a third *Sturmgeschütz* had to be destroyed for the same reason.

On 17 December, the *Abteilung* had only one serviceable *Sturmgeschütz*. Of the original 24 the unit had available at the beginning of the march, 15 had been immobilized and loaded onto railway wagons, one was lost due to enemy action, and three had to be destroyed. The remaining four could not be repaired until 15 January 1942.

The *Abteilung* considers that the main reasons for the high number of failed *Sturmgeschütz* are:

1.) The heavy wear inflicted on the *Sturmgeschütz* since 22 June 1941, and because they could not be thoroughly maintained or repaired due to the lack of spare parts.
2.) Travelling over very rough terrain during the last commitment.
3.) The continuous running of the engines caused numerous breakdowns.

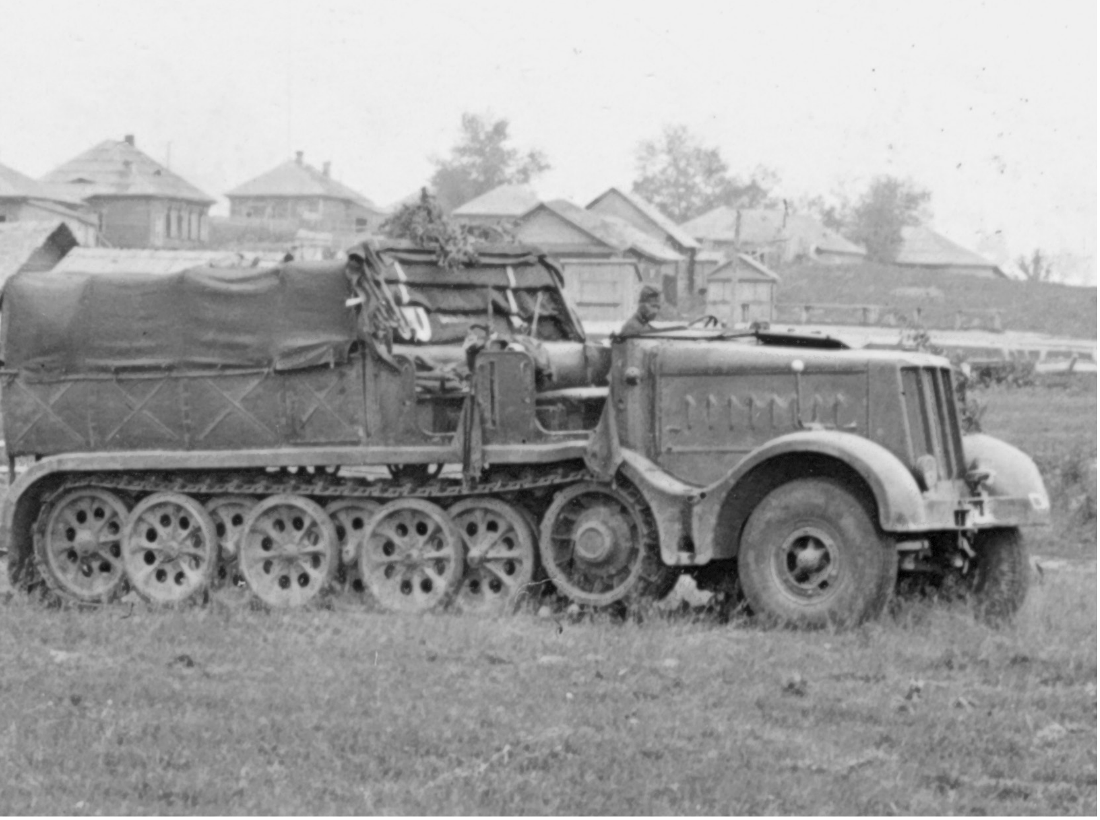
4.) The severe cold led to track breakages. Also our ZgKw suffered many leaf spring, torsion bar, and idler wheel failures.
5.) Due to the extreme cold, all greased suspension parts froze, which immobilized the vehicle. Emergency means such as lighting a fire under the vehicle or heating with a blowtorch were effective for only a short period.

Overview for 1942:

On 1 January 1942, the *Abteilung* will establish a *Restbatterie* (remnants battery) of five *Sturmgeschütz*, to be operational by 15 January 1942. Following orders from the commander of 18.Army, the *Abteilung* is to form a rifle company of 160 men, to be combat ready by 5 January 1942.

The following vehicles will be returned to the homeland [Germany], because repair is impossible in the field.

15	*Sturmgeschütz*
11	SdKfz 252 and 253
6	3t ZgKw un-armoured
3	SdKfz 9
7	SdKfz 10
27	Trucks
30	Kfz 1 cross-country cars



The 18-ton Famo F2 was originally design as a *schwere Zugkraftwagen* (heavy tractor) designated *Sonderkraftfahrzeug* (SdKfz – special purpose vehicle) 9 as a prime mover for heavy artillery including the 24cm *Kanone* 3, but was soon adopted by the *Panzerwaffe* as a recovery vehicle. Some 2,500 of the type were built between 1938 and 1945. (Anderson)

6	Heavy motorcycles
30	Medium motorcycles
2	SdAnh 6/42 trailers
2	SdAnh 32 ammunition trailers.

This after-action report reveals the numerous serious problems that German forces (and the Russians) had to face. Although the Russian soldier was repeatedly described by the German military as being courageous, dogged and clever, the Russian winter was an enemy even harder to overcome. The vast majority of losses on the Volkhov front were due to mechanical breakdowns caused by the extreme cold and heavy snowfall (the unit had encountered only a few enemy tanks).

The report further proves that by November, StuGAbt 185 was organized according to KStN 446, dated 1 November 1941, with seven *Sturmgeschütz* in each battery, including those for the *Batteriechefs* (battery leaders). Including the vehicles sent at the end of October, a total of 24 *Sturmgeschütz* were now available, three over planned strength. As detailed in the list of vehicles to be returned for repair, the unit had still parts of their original establishment available, as noted in the earlier KStN. However, it is thought that the 11 SdKfz 252s and 253s on the list, were not returned to the unit after repair.

In April 1942, StuGAbt 185 was re-equipped in the field and received a number of StuG Ausf E, also possibly some *Langrohr-Geschütz*.

Problem Solving

Faced with increasing of numbers of improved, (in many ways superior) modern Soviet tanks, the German military was forced to react. In late 1941, the *Panzerkommission* was established, a board of tank specialists drawn from the *Oberkommando des Heeres* and the armaments industry. On 1 March 1942, several high-ranking officers and senior engineers (the latter employees of Krupp, Alkett, and Maybach along with some from the oil industry) held a meeting at the rear positions of 12.PzDiv in Narva, Estonia:

> The purpose of the *Panzerkommission* is to evaluate experience gained during combat between German and Russian tanks in the previous winter.
>
> Technical details:
>
> I.) Tracks: Those on the PzKpfw III and IV are too narrow, and lack sideways grip; sliding off raised or ice-covered roads was a continuous problem. The tracks on Russian tanks are far superior. Additional ice studs (a temporary fix) fitted to the tracks have only a limited effect, but cause serious wear to the running gear. A re-designed of the track is a priority.
>
> II.) Suspension: This has suffered frequent problems (broken springs and torsion bars). An overlapping roadwheel suspension, as used on the ZgKw [halftrack vehicles], is under development and an improvement is anticipated. Resilient road wheels, as used on Soviet heavy tanks, are currently being tested. But there have been problems with their manufacture.
>
> IV.) Engine: Compared to Soviet tanks, the engines used in German tanks have many problems… The recently introduced cold starting process where cooling water from a cold engine is transferred, via connecting pipes, to a hot engine for pre-heating is to be tested by the troop. In combat this procedure is not practical for the following reasons:-
>
> 1.) Too time consuming
> 2.) Gathering tanks too closely together
> 3.) Seldom possible in defensive positions
>
> VI.) Weapons and Optics: Sighting optics fitted in German tanks are far superior to those in Soviet tanks. Problems with the optics misting-up are solved when the heating system works properly. Fighting power is currently being improved by installing 5cm *lang* [long] and 7.5cm *lang* in current production tanks.

As time would show, a complete redesign of the sPaK weapon system was not possible. In 1942, serious attempts were started on the development of new types of battle-superior tanks for the *Panzerwaffe*; the *Sturmartillerie* had to rely on *Kampfwertsteigerungen* (combat efficiency improvements) of their existing hardware – the *Sturmgeschütz*.

Even a shallow frozen stream could cause a serious problem if the ice was too thin to allow a safe transit. Members of StuGAbt 210 attempt to recover a *Sturmgeschütz* by placing wooden planks under the tracks and using another *Sturmgeschütz* as a towing vehicle. (Anderson)

Langrohr – Defeating Enemy Armour

On the German side, the undoubted superior armour protection and firepower of the latest Soviet tanks inevitably led to them increasing their efforts to develop and manufacture more powerful anti-tank guns.

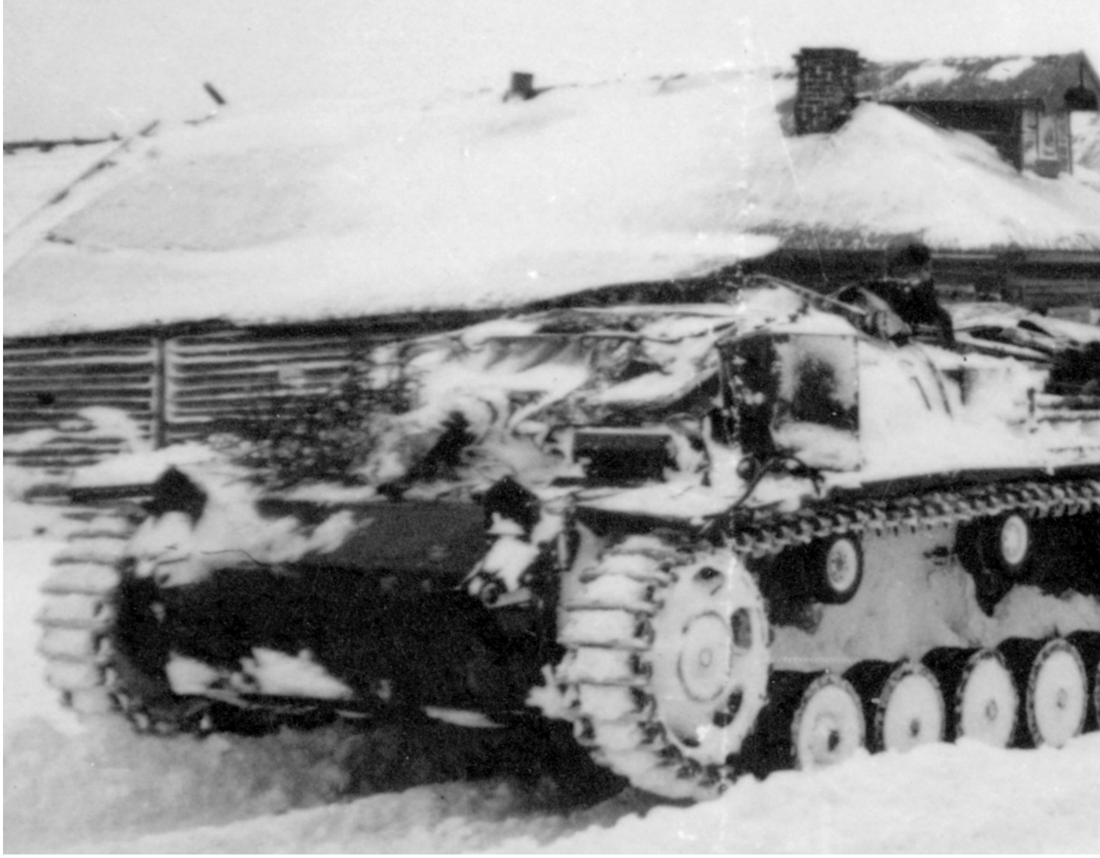
At the end of 1941, the performance of the 7.5cm K L/24 ammunition was effectively enhanced, but only within certain limits. The introduction of the 7.5cm Gr 38 (HL) shaped-charge round made it possible to fight T-34 and KV-1 and KV-2 tanks, but ballistic performance remained far from satisfactory. A decisive change could only be achieved by developing and producing improved ordnance. If the 7.5cm calibre was to be retained, then armour penetration capabilities had to be considerably increased. The simplest, and quickest, way of achieving this was to improve muzzle velocity, thus increasing the effectiveness of the shell when it hit the target. To achieve this it would be necessary to lengthen the gun barrel and increase the power of the shell propellant. These changes would also give improved accuracy due to the flat trajectory achieved by higher muzzle velocity.

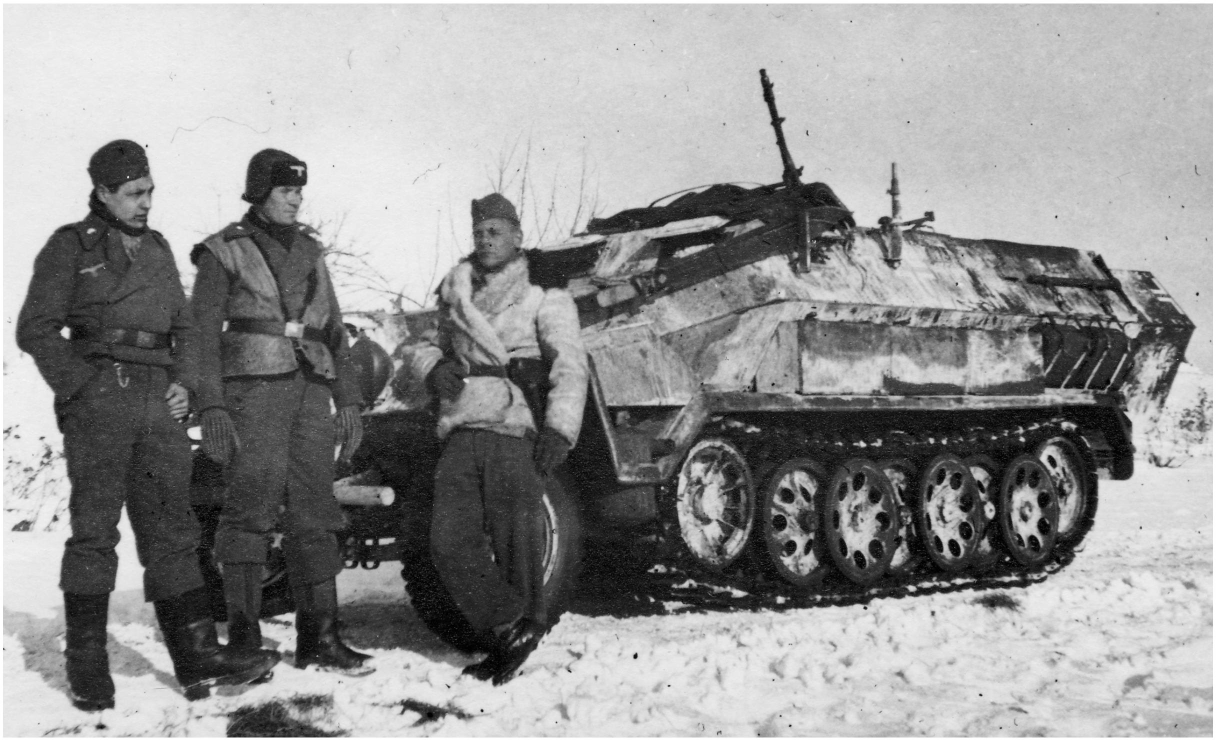
It is interesting that the design work for a long-barrelled 7.5cm gun with improved muzzle velocity for the *Sturmgeschütz* had actually been started before the outbreak of World War II.

Many questions remain unanswered. Why was this decision made, when the 1940 manual on the tactical usage of *Sturmgeschütz*

Right: Keeping front-line forces supplied with ammunition, fuel and food was of utmost importance, but this was always a difficult operation in the mud or snow of the Russian landscape. Due to the lack of sufficient heavy halftracks, *Sturmgeschütz* units were forced to use their assault guns as recovery vehicles. (Münch)

Below: When the SdKfz 251 *Schützenpanzerwagen* (SPW – armoured personal carrier) was first issued to the *Sturmbatterien*, it was intended to be used as transport for replacement *Sturmgeschütz* crews. However, as the war progressed the type was used for many different duties. (Anderson)



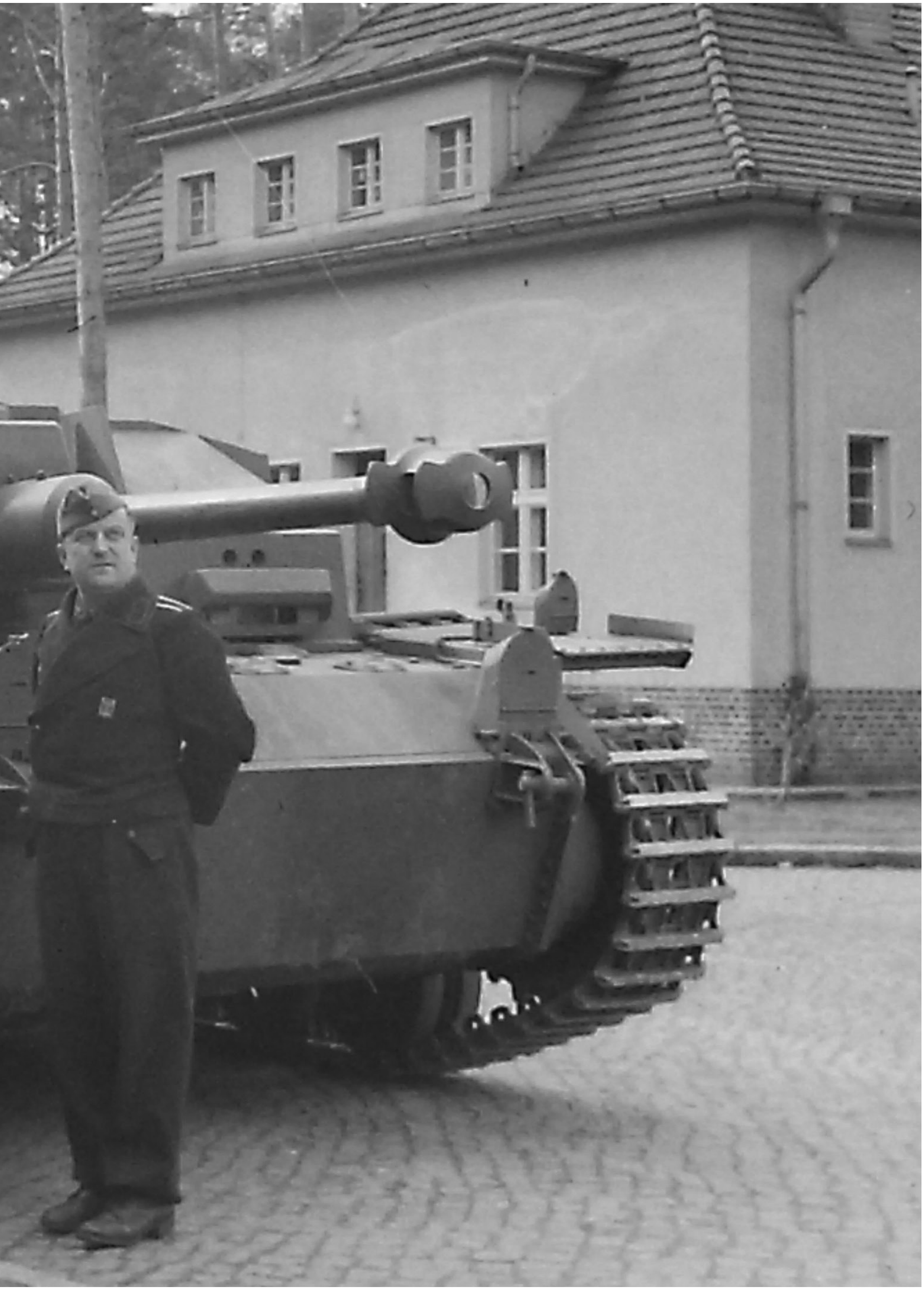


stipulated that combat against enemy tanks should only happen in an emergency. Had these tactics been recognized as being partially wrong before *Sturmgeschütz* were deployed in combat. Or should the tasks of the *Sturmgeschütz* simply be expanded by fitting the type with a more powerful gun. And why was the PzKpfw IV, which by 1938 was had also been designed as a support tank primarily for fighting soft targets, not included in the planning. The few available documents dealing with the *Langrohr* do not mention this important tank.

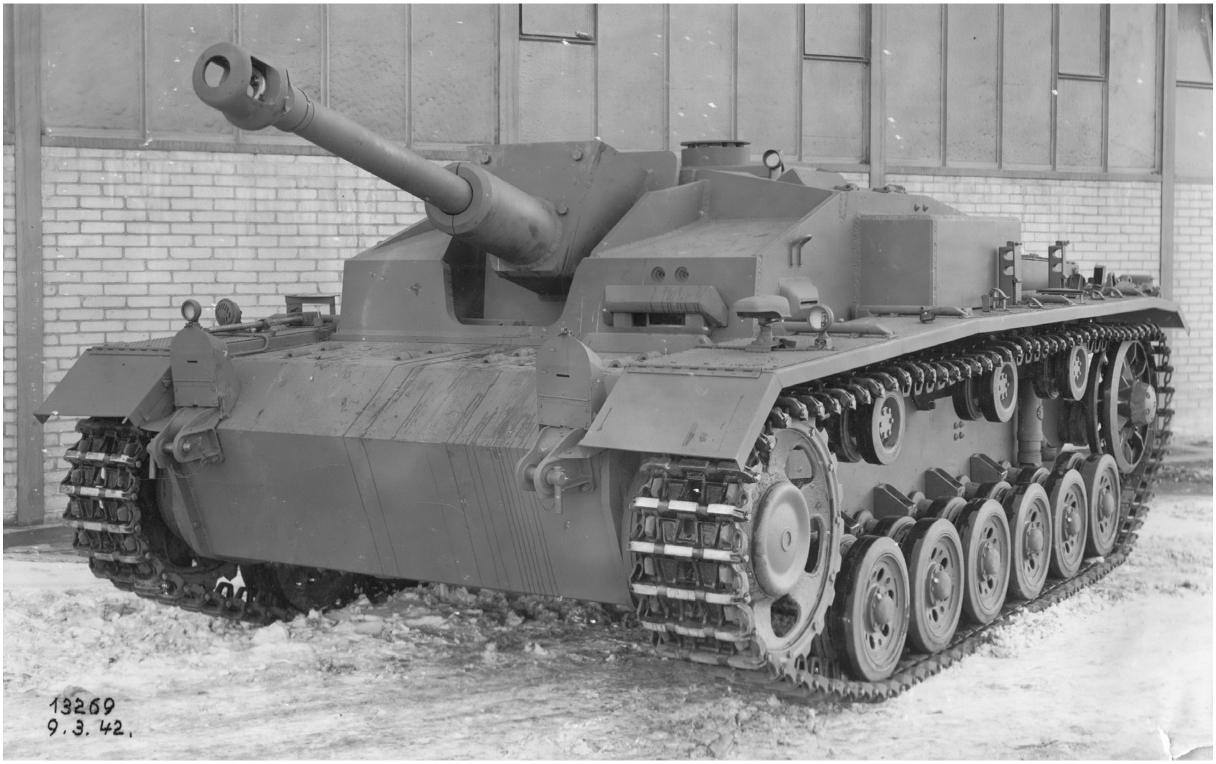
However, as early as 1938, some 18 months before production of *Sturmgeschütz* commenced, the two major German armament manufacturers Rheinmetall-Borsig and Krupp were authorized to develop a *verstärktes* (enhanced) *Sturmgeschütz*.

Aset of documents preserved at the *Militärarchiv* in Freiburg, Germany, states:

> 3 August 1938
> *Waffenamt Prüfwessen* 4 (WaPrüf – Army Weapons Agency, artillery branch) requests that Rheinmetall-Borsig deliver drawings for a 7.5cm *lang*.
>
> 6 August 1938
> WaPrüf 4 (Herr Busch, Herr Sallant) informs Krupp department AK (Dorn) about the length of the inner lining (283cm) and the length of the recoil (60, if possible 50cm).



An unknown number of *Versuchsfahrzeuge* (test vehicles), using the chassis of a PzKpfw III Ausf F, were fitted with the Krupp-manufactured 7.5cm L/41 *Langrohr* (long-barrelled gun) for firing trials at Jüterbog. The front of the superstructure is little changed, but the centre section has been significantly widened. The Krupp L/41 used the standard gun mounting and was fitted with a rectangular-shaped mantlet. A double-baffle muzzle brake is fitted on the gun barrel. (Anderson)



The first production *Sturmgeschütz* Ausf F to be armed with the 7.5cm StuK 40 L/43 gun: Note the *Selbstfahrlafette-Zielfernrohr* (Sfl-ZF) 1a periscope for the gunner. The sloped roof plates of the superstructure proved to be a bullet trap, a problem that was solved with the introduction of the Ausf F/8. A ventilator was fitted in the roof to extract fumes from the new gun. All *Sturmgeschütz* armed with a StuK 40 were known as '*Langrohr*', no matter whether an L/43 or the later L/48 gun was installed. (Historyfacts)

11 August 1938
Rheinmetall confirms shipment of the drawings.

29 October 1938
AK informs Dr Riedl that a 7.5cm L/40 barrel for manufacturing sPaK is being manufactured.

3 November 1938
In a letter to Herr Braun, Krupp designates the gun as 7.5cm L/40 sPaK *verstärkt*.

2 December 1938
WaPrüf 1 (ammunition branch) requests drawings from Krupp for the following:-
KG *rot* Pz according to 13St1215
7.5cm Gr 34 according to 13St1215
Cartridge (8310) from the 7.5cm K Sf according to 13C6310

22 December 1938
WaPrüf 1 confirms receipt of the drawings sent by Krupp. Cartridge (8310) has a length of 514mm.

31 December 1938
Krupp (Dept AK, Herr Baum) identified a problem with the ejection of the

7.5cm K Sfl's cartridge to Dr. Riedl. Baum requests an investigation as to whether a conical-shaped bottom can be fitted to the cartridge.

12 January 1939
Krupp confirms to complete WaPrüf 4 that sPaK (*verstärkt*) with barrel L/42 will delivered to the WaPrüf 6 test location.

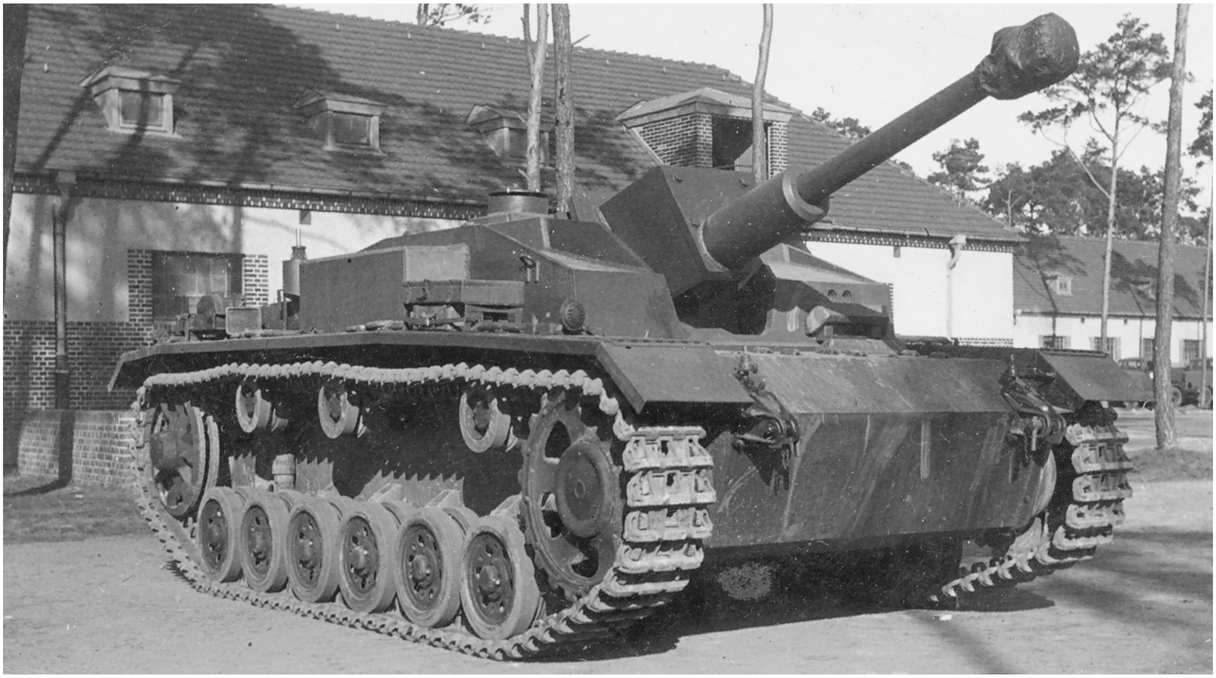
4 May 1939
Krupp informs that delivery of the 7.5cm L/42 (*verstärkt*) cannot be made until mid-October 1939.

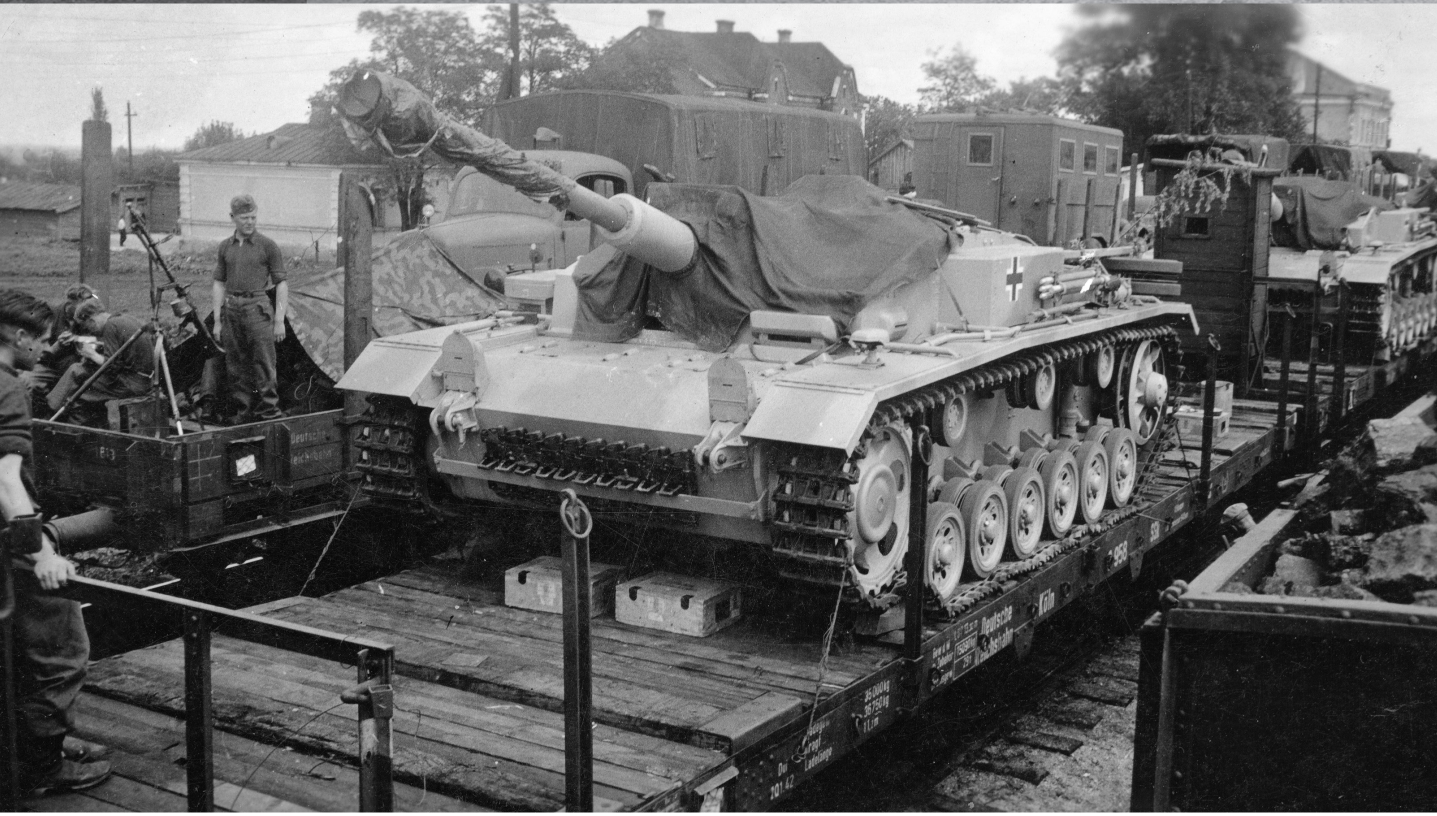
22 February 1940
WaPrüf 4 orders 30 rounds of ammunition for the 7.5cm L/24:
Two rounds with a cartridge for a muzzle velocity of approximately 500mps.
Eighteen rounds with a cartridge for a muzzle velocity of approximately 670mps.
Ten rounds with a cartridge for a muzzle velocity of 670mps.
Thirteen inert training rounds.

15 March 1940
Test firing report from *Heeresabnahmestelle* [delivery point] Unterlüss:
Three guns 7.5cm, Nos 1 to 3
No complaints.

Fired:
3kg Patr *rot* small charge

One of the first *Sturmgeschütz* Ausf Fs, finished in *dunkel grau* (dark grey) at Jüterbog, is a *Befehls-Sturmgeschütz* (command vehicle): Note the armoured porcelain pot-type isolator, for the *Sternantenne* d (star antenna), fitted on the rear of the right pannier. The vehicle is mounted with a 7.5cm StuK 40 L/43. (Anderson)





Several new *Sturmgeschütz* Ausf F mounting the 7.5cm StuK 40 L/48 gun, loaded onto railway wagons for transport to the east. Note, the German crosses are stencilled only on the side panniers. Like many other German armoured vehicles produced after mid-1942, they have been finished in tropical camouflage (sand-yellow base with grey-green patches). Also it appears that an attempt has been made to disguise the long-barrelled StuK 40 guns. (Münch)

15kg Patr rot standard charge
30kg Patr rot with fuze, standard charge

5 April 1940
Notice from OKH to Krupp: Change of the designation from 7.5cm *Kanone* (Pz Sfl) to *Sturmgeschütz*.

11 April 1940
Commencement of test firing the *lang* 7.5cm *Kanone* (PzSfl) barrel V1 and cradle at Meppen.

18 April1940
Meppen informs that ejection of cartridge was unsatisfactory. Meppen requests further ammunition and a double-baffle muzzle brake.

7 May 1940
Report on the test firing of 7.5cm barrel V1 at Meppen. Herr Theermann, from department Hainmüller, confirms poor cartridge ejection. Barrel and muzzle brake worked faultlessly, brake recoil reduced by 47 per cent.

On 13 October 1939, the *Waffenamt* reported in a note:

> With reference to the oral order from Department 7 this month, I report:
> 4.) Progress of the PzSf III with 7.5cm L/41, muzzle velocity 685mps:
>
> The first test vehicle, fitted with mild-steel superstructure, built for firing trials will be available in May 1940.

There is photographic evidence which shows that the test vehicle arrived at Jüterbog at an earlier date. German military authorities and the front-line troops referred to the long-barrelled gun as *Langrohr*. Official after-action reports often used the abbreviated designation *lang* (l – long).

The Improved *Sturmgeschütz*

The new gun was mounted in an available PzKpfw III hull, possibly an Ausf F. A modified superstructure was designed and fabricated from mild steel, which allowed modifications and other changes to be easily made. Since the new gun fired a considerably longer shell it was essential to have more space inside the vehicle, and so the superstructure was widened onto the track covers. The extra room allowed the same number of ammunition rounds to be carried, and the installation of more radio equipment was easily possible. However, two further major drawbacks in the design of the *Sturmgeschütz* were not solved with this prototype for unknown reasons. There was no improvement to the commander's observation means and the vehicle still lacked a close-defence weapon.

The *Sturmgeschütz lang* was then thoroughly tested at Jüterbog and the nearby Kummersdorf firing range.

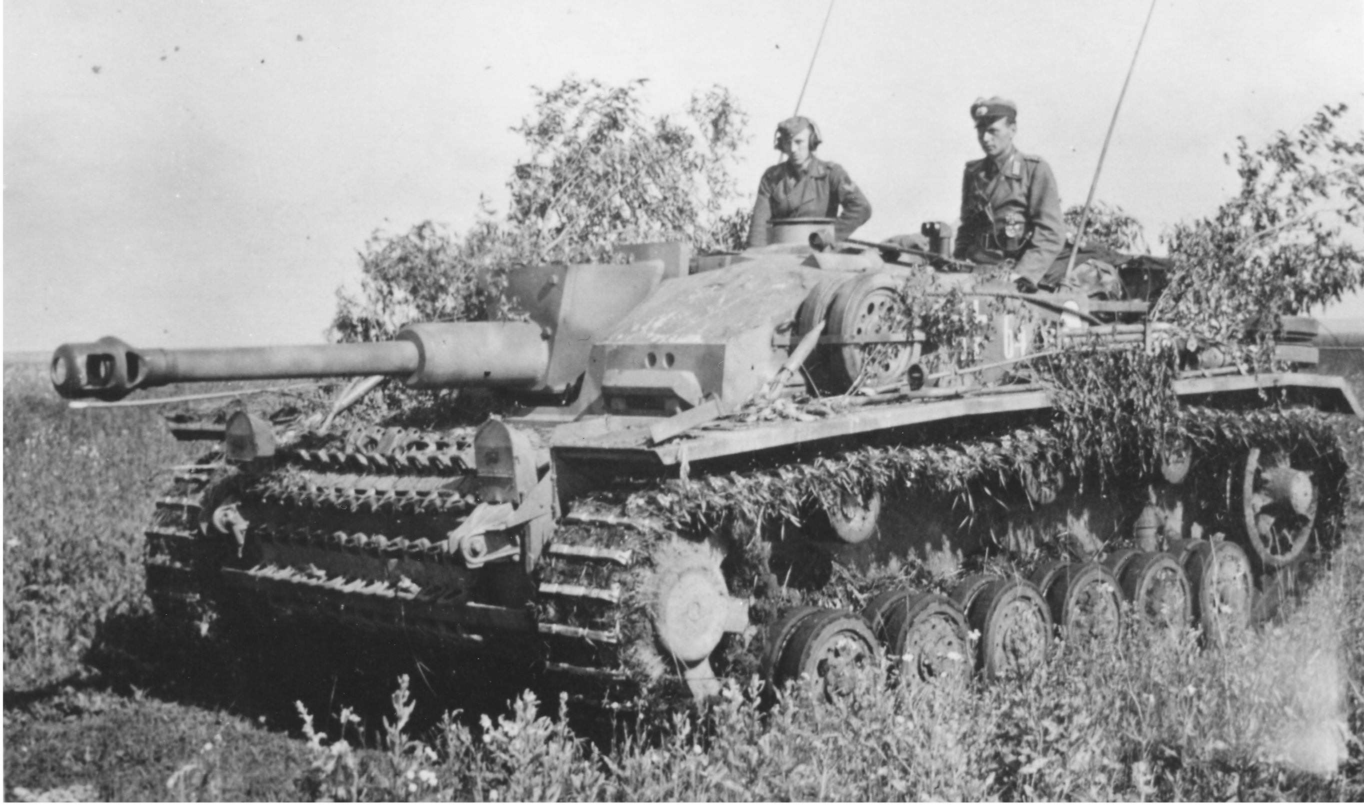
After a demonstration to Hitler, *Waffenamt Prüfwessen* 6, the department responsible for the test and evaluation of armaments, reported in a letter in March 1941:

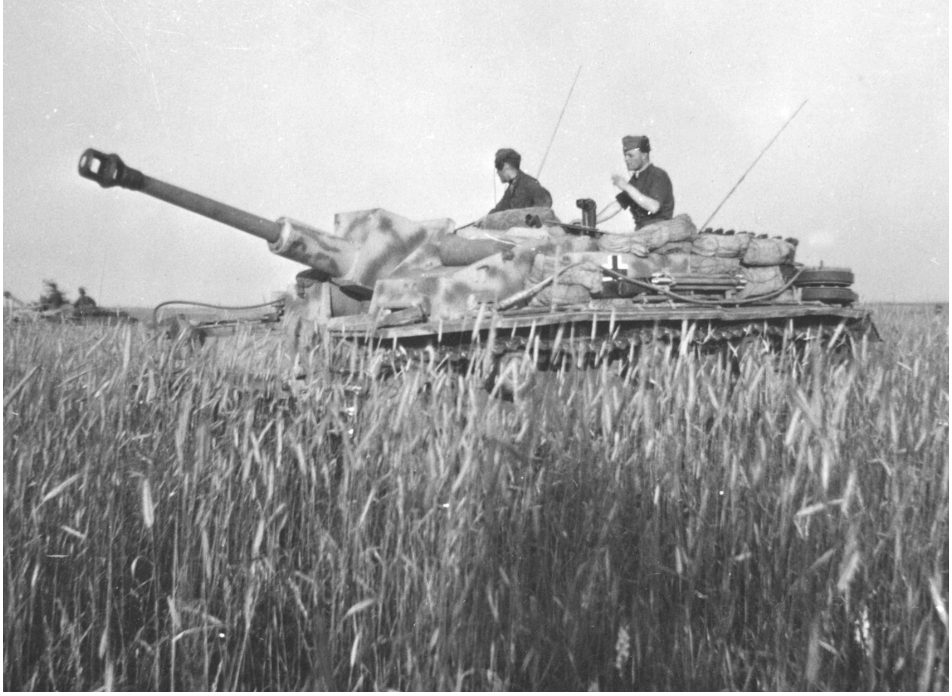
> Demonstration to the *Führer* on 31 March 1941.
>
> Procurement of the *Sturmgeschütz* with 7.5cm KwK L/41 *lang*.
> Provided that the troop trials are successful, production can start in late spring 1942.

Sadly, no information is available as to the detail of the troop trials. However, the first 7.5cm *Langrohr* had been completed and tested.

Parallel to this development Rheinmetall had finished work on a 7.5cm *Panzerjägerkanone*, as the successor to the 5cm PaK anti-tank gun. The new gun had a calibre length of L/46. Compared to this new weapon, the 7.5cm Krupp-built gun installed in the *Sturmgeschütz* test vehicle was seen to have inferior armour penetration. To resolve the situation, *Waffenamt* A ordered Rheinmetall and Krupp to work together. As a result, the Rheinmetall barrel was attached to the Krupp breech and cartridge chamber.

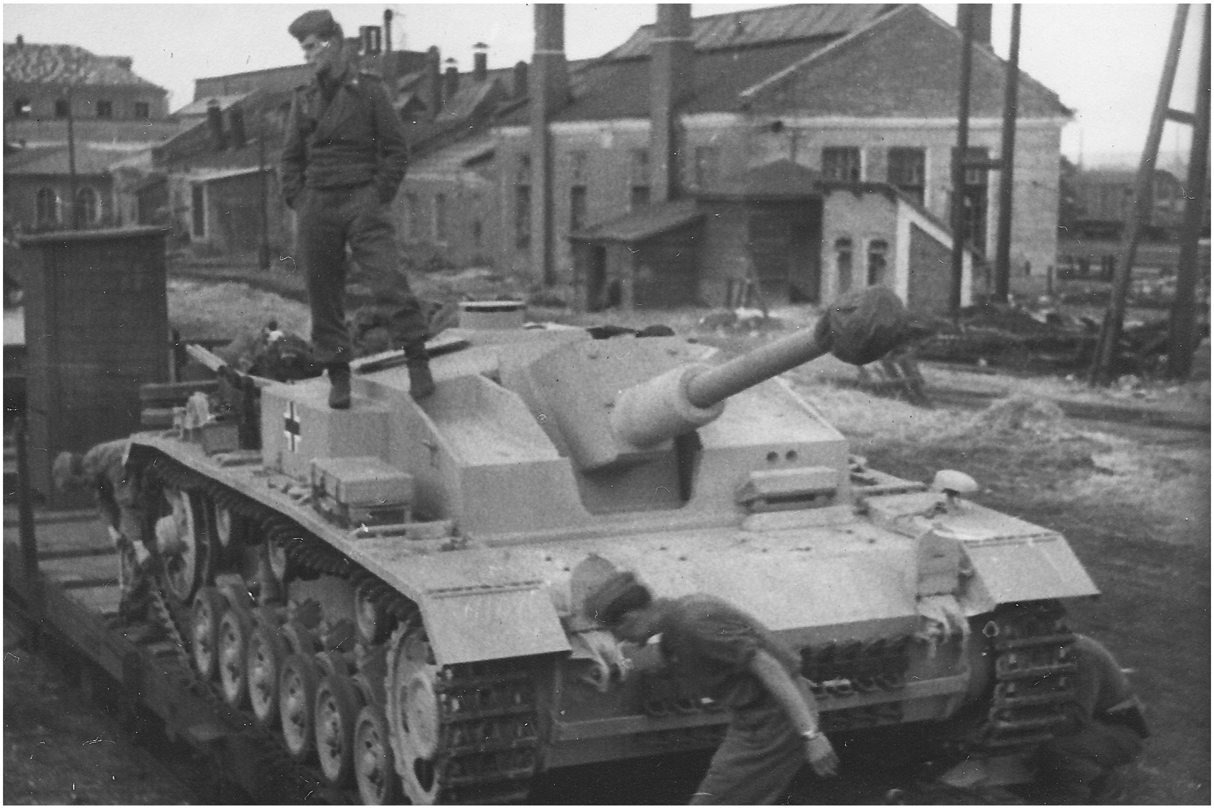
This gun, designated as 7.5cm StuK 40 L/43, had a shorter cartridge chamber when compared to the PaK 40. This was regarded as a necessity

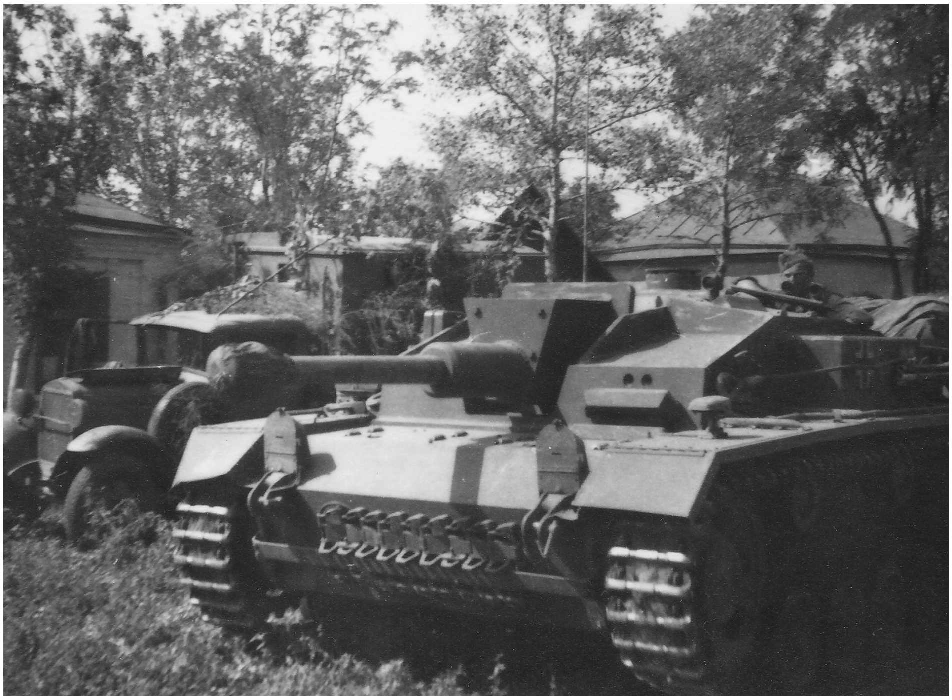




Above: *Sturmgeschütz-Abteilung-Großdeutschland* (StuGAbt GD) was the first unit to receive the long-barrelled *Sturmgeschütz* Ausf F. Immediately after having been supplied with 22 vehicles it was sent to the Eastern Front. On arrival, their crews immediately began covering bullet traps in the front of the superstructure with concrete. (Anderson)

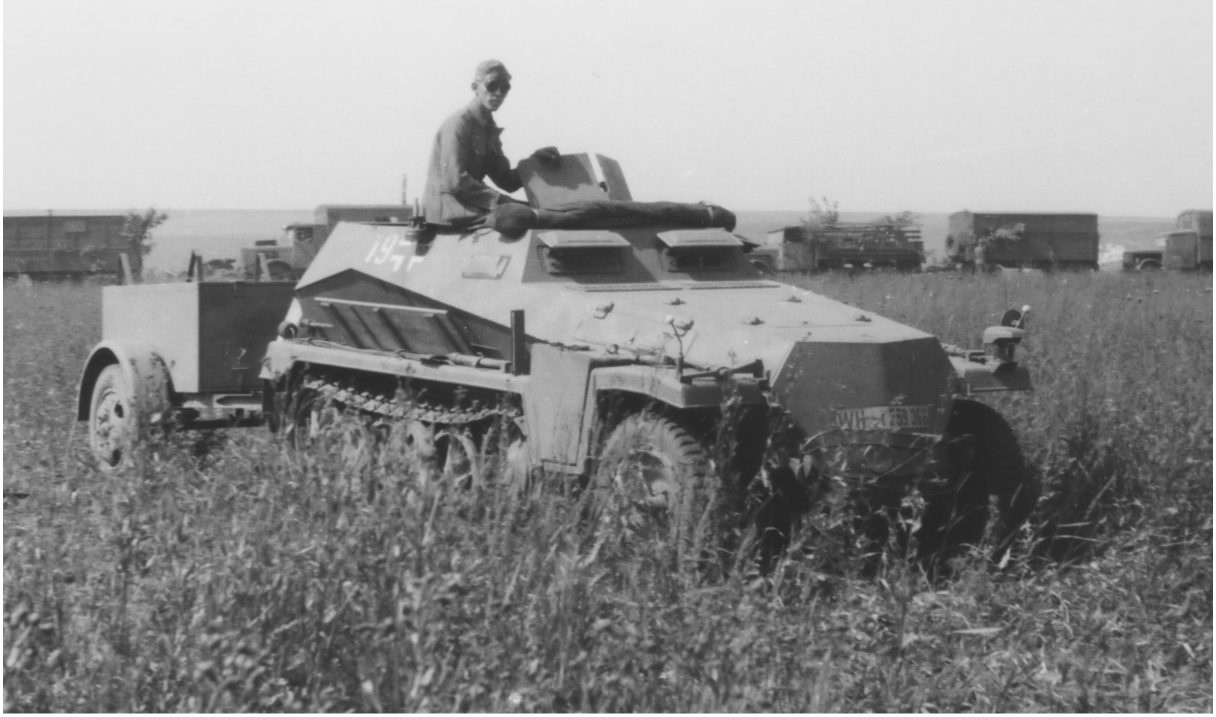
Right: The crew of this *Sturmgeschütz* Ausf F (L/43) have sandbags placed on the front slope of the superstructure and the panniers. (PeKo)





Above: A *Sturmgeschütz* armed with a StuK 40 L/43 being transported to the Eastern Front. There is no apparent explanation as to why, in 1942, some *Sturmgeschütz* were painted yellow and some were not. It is possible that the vehicles were from those batches intended for shipment to North Africa, but not sent. (PeKo)

Left: A *Sturmgeschütz* Ausf F from StuGAbt 184 armed with the StuK 40 L/43, passes a captured Russian truck parked in a village. A protective cover for the gun is fitted over the muzzle brake to prevent the ingress of dirt and dust.



The SdKfz 250/6 was designed to replace the SdKfz 252. Only a small number of these valuable light armoured halftrack vehicles (all versions used the same chassis) were issued to *Sturmgeschütz* units as other models were desperately required for combat. The vehicle is from StuGAbt GD and is towing a *Sonderanhänger* (SdAnh 31/1) trailer which carried 48 rounds of 7.5cm StuK 40 ammunition. (Anderson)

due to space limitations inside armoured vehicles. A double-baffle muzzle brake was added to the gun.

It is worth noting that the calibre length describes the barrel length in relation to the calibre. A 75mm gun with 70 calibre lengths would have an actual length of 5,250mm. If a muzzle brake was fitted, the length was added. Very small variations are possible.

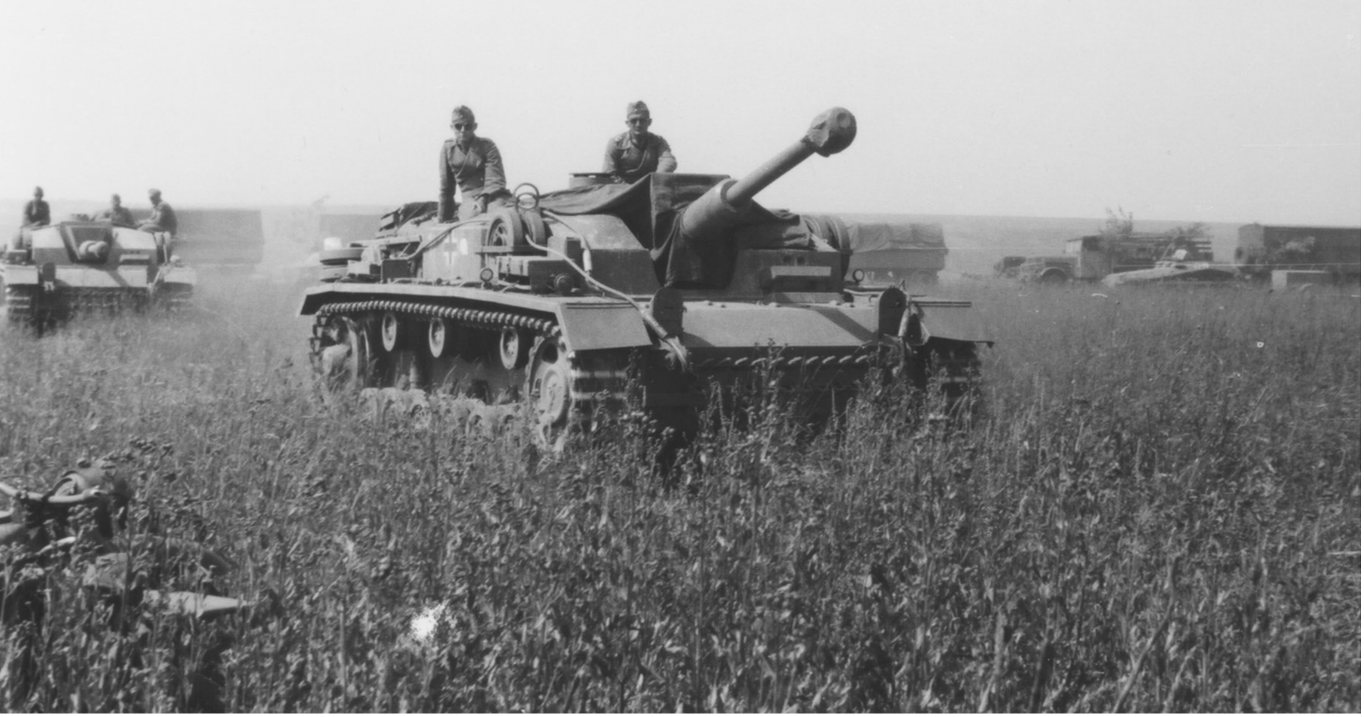
The 7.5cm StuK 40 L/43 fired the following rounds:

7.5cm SprGr Patr 34
This was the standard high-explosive (HE) round fitted with an impact (or delay) AZ 23 fuze.

7.5cm PzGr Patr 39
This was the standard APCBC shell for combat tanks.

7.5cm PzGr Patr 40
As used with 3.7 and 5cm tank and anti-tank guns, a *Sondermunition* with a tungsten core was available for the 7.5cm StuK 40 APCR (armour-piercing, composite rigid). However, the low supply of tungsten led to a very small number being available. PzGr 40 projectiles were to be used only for combat against heavy tanks.

7.5cm PzGr Patr 40 (W)
This round was externally identical to the standard PrGr 40, but the tungsten core was replaced by unhardened steel. According to a document, this round



Sturmgeschütz of StuGAbt GD advance through a cornfield: Note that the tarpaulin covering the roof as the superstructure was not totally waterproof and that towing ropes have been attached to the front shackles in case of an emergency. The divisional marking of the StuGAbt GD unit, a white steel helmet, has been painted on the side of the pannier box. (Anderson)

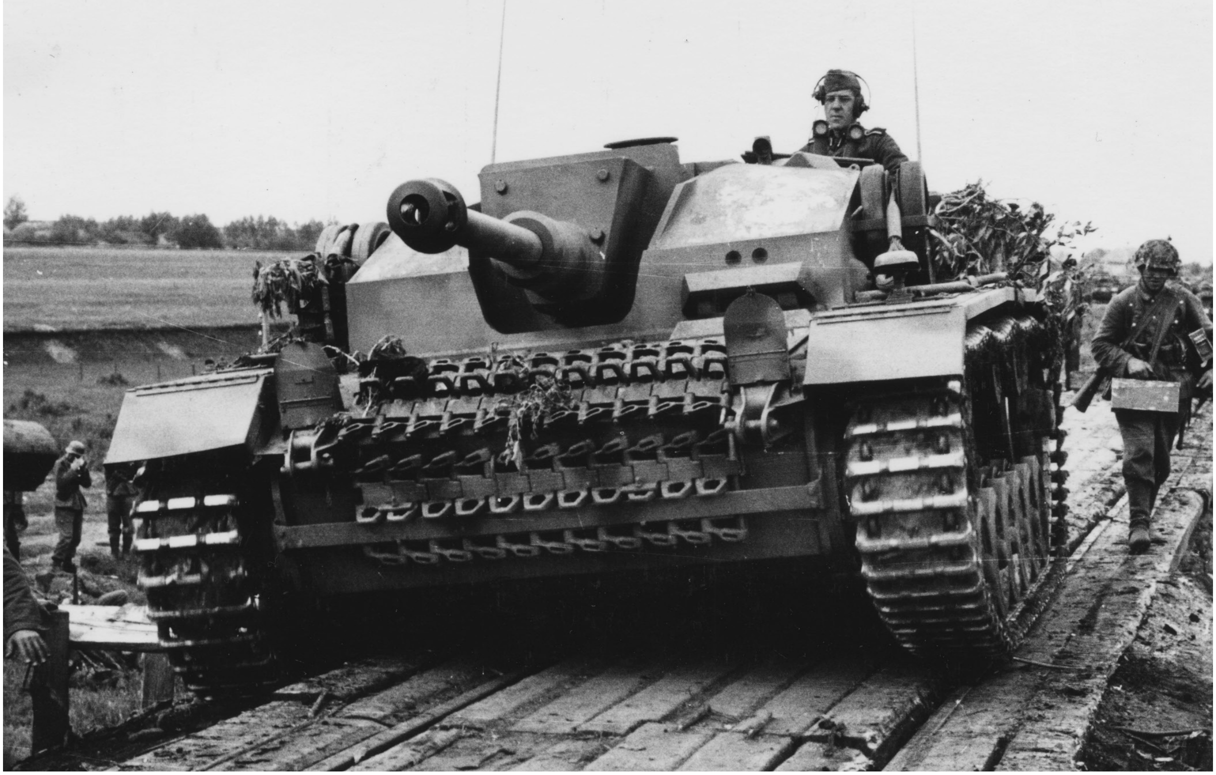
was to be produced on demand only as a substitute for the PzGr 40, when tungsten was unavailable. This allowed production facilities to keep running and assure a steady supply. The performance of the round was seriously inferior to the PzGr 39.

7.5cm Gr Patr 38 HL/B, 7.5 cm Gr Patr 38 HL/C
The *Hohlladungsgeschosse*, (shaped-charge projectiles – HEAT) was an effective and low cost shot. Although useful, its accuracy was reduced by a low muzzle velocity and a high trajectory. The performance continued to be improved during production.

7.5 cm NbGr Patr
Smoke shell.

In June 1941, the OKH began compiling a list detailing the 'consumption of ammunition'. A careful evaluation of this list gives comprehensive information on the quality and quantity of ammunition used on the Eastern Front.

In 1942, the PzGrPatr 39 was the most numerous and possibly most important anti-tank round available for the 7.5cm StuK 40 L/43. The more powerful PzGr 40 was available in limited quantity only, as tungsten was a *Mangelmaterial* (scarce material). In the second half of 1942, both *Sturmgeschütz* and PzKpfw IV only fired 6,420 rounds. Even in the 'heat' of a battle, crews had to be selective and use HL and PzGr 39 rounds: the solid shot PzGr 40 was to be used only when engaging any tank which was 'difficult to combat'. According to other documents of that time, a 7.5cm PzGr 40 W was also available, but this round is not specifically mentioned in



A *Sturmgeschütz* Ausf F of StuGAbt GD armed with the 7.5cm StuK 40 L/43, crosses a specially laid planked roadway. (Anderson)

the list of consumed ammunition. From September 1942, the 7.5cm GrPatr 38 HL/B was available and used in large quantities.

In January 1942, the GrPatr 38 shaped-charge round became available for the 7.5cm StuK L/24. Later in the year, an improved HL/B round became available. Due the introduction of the GrPatr 38, production of the PzGrPatr rot ceased. As the OKW lists show, there were still large stocks to be used.

Techical data for German 7.5cm guns as of 1941/42

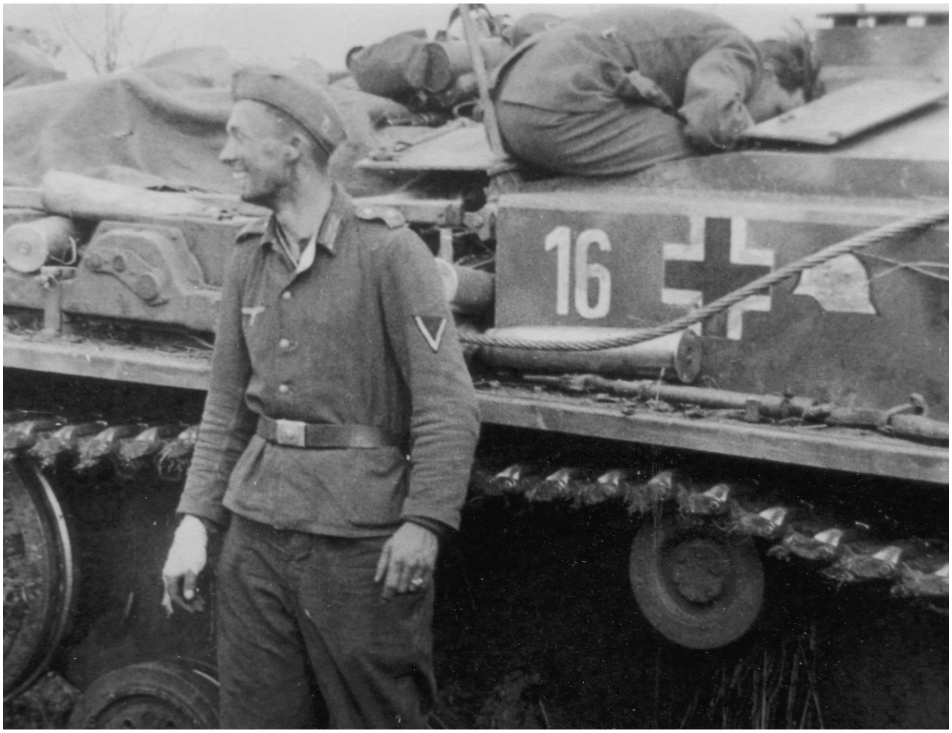
Weapon	7.5cm K/KwK	7.5cm KwK *lang* Krupp	7.5cm KwK 40/StuK 40			
Application	StuG Ausf A-E	Prototype StuG lang	StuG Ausf F, F/8, G			
Calibre length	L/24	L/41	L/43 resp L/48			
	GrPatr 38 HL/B	all projectiles (?)	PzGr 39	GrPatr38 HL/B	PzGr 40	PzGr 40 (W)
Muzzle velocity m/sec	450	ca. 685	790	450	990	990
Penetration im mm at range						
100m	75	unknown	106	75	143	80
500m	75	unknown	96	75	120	75
1,000m	75	unknown	80	75	97	63
1,500m	75	unknown	63	75	77	void

L/24 Ammunition consumption *Ostheer*

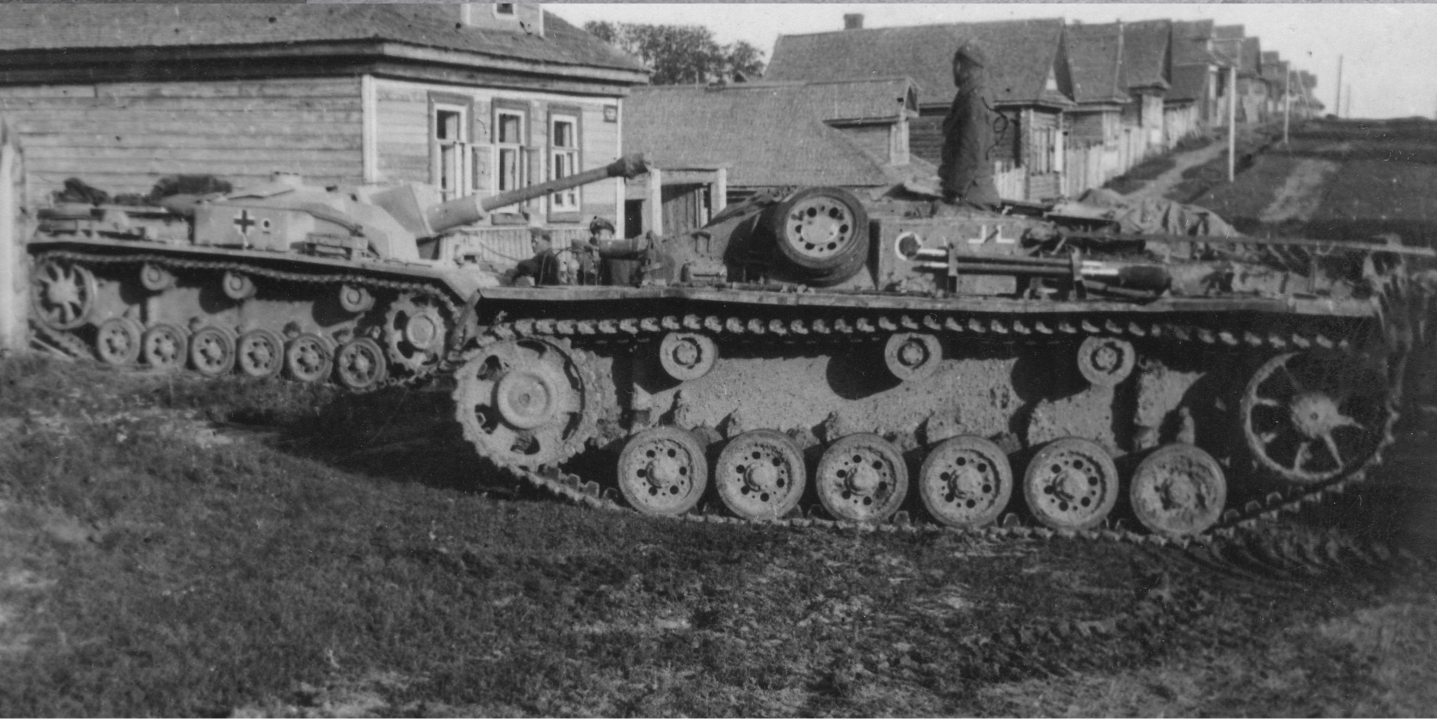
Weapon	7.5cm K 7.5cm StuK				
Used with	PzKpfw IV *Sturmgeschütz*	7.5cm SprGrPatr	7.5cm PzGrPatr	7.5cm GrPatr 38	7.5cm NbGrPatr
June 41		38,579	10,783		2,951
July 41		115,735	32,347		8,853
August 41		75,821	4,881		945
September 41		73,966	5,385		1,891
October 41		73,253	11,751		3,230
November 41			No figures available		
December 41		35,200	4,800		1,500
Total		**412,554**	**69,947**	**0**	**19,370**
January 42		35,200	5,400	1,800	2,200
February 42		49,500	12,000	4,600	1,600
March 42		45,800	12,100	13,200	600
April 42		17,500	5,000	9,600	2,200
May 42			No figures available		
June 42		21,700	10,100	32,200	2,600
July 42		29,400	9,400	17,400	1,200
August 42		26,500	52,000	1,200	11,600
September 42		16,700	9,600	38,800	1,400
October 42		8,600	2,100	12,000	700
November 42		57,900	19,400	27,100	7,400
December 42		14,300	10,400	32,700	2,700
Total		**323,100**	**95,500**	**241,400**	**23,800**

L/43 & L/48 Ammunition consumption *Ostheer*

	7.5cm KwK 40 7.5cm StuK				
	PzKpfw IV *Sturmgeschütz*	7.5cm SprGrPatr 39	7.5cm PzGrPatr 39	7.5cm PzGrPatr 40	7.5cm GrPatr 38 HL/B
May 42			No figures available		
June 42		2,000	2,300	20	
July 42		6,100	4,500	1,300	
August 42		11,600	16,100	100	
September 42		17,000	11,400	1,600	9,800
October 42		7,600	5,500	800	6,400
November 42		17,500	7,600	300	4,100
December 42		20,900	16,600	2,300	28,900
Total		**82,700**	**64,000**	**6,420**	**49,200**



A *Sturmgeschütz* Ausf F from StuGAbt GD vehicle being replenished with 7.5cm GrPatr ammunition, several rounds of which are carelessly stacked on the track guards. Officially, ammunition storage for the type was 44 rounds, but this was almost doubled by removing the stowage racks. (Anderson)



In 1942, large numbers of short-barrelled *Sturmgeschütz* remained in service with a number of units. Here a *Sturmgeschütz* Ausf D from StuGAbt 189 is parked in front of an Ausf F (7.5cm StuK 40 L/48) of the same unit. When the service life of a 7.5cm StuK 40 L/43 gun came to an end it would normally be replaced by an L/48. (Anderson)

Sturmgeschütz Ausf F and F/8

With availability of the 7.5cm StuK L/43 it was decided to fit the new gun in production *Sturmgeschütz* as quickly as possible. The chassis of the Ausf E, which entered production (initial order for 500 units) in September 1941, was adapted. The Ausf E superstructure required only a small number of minor modifications, resulting in a vehicle which bore little resemblance to the *Langrohr* prototype. (It is possible that this was decided in order not to affect the smooth running of *Sturmgeschütz* production.) A year later, a significantly larger superstructure was designed and introduced into production.

The installation of the gun was possible without significant changes to the basic design, except that the gun-recuperator required an enlarged housing. Among other minor changes, new ammunition racks were fitted, along with a roof ventilator to remove firing fumes.

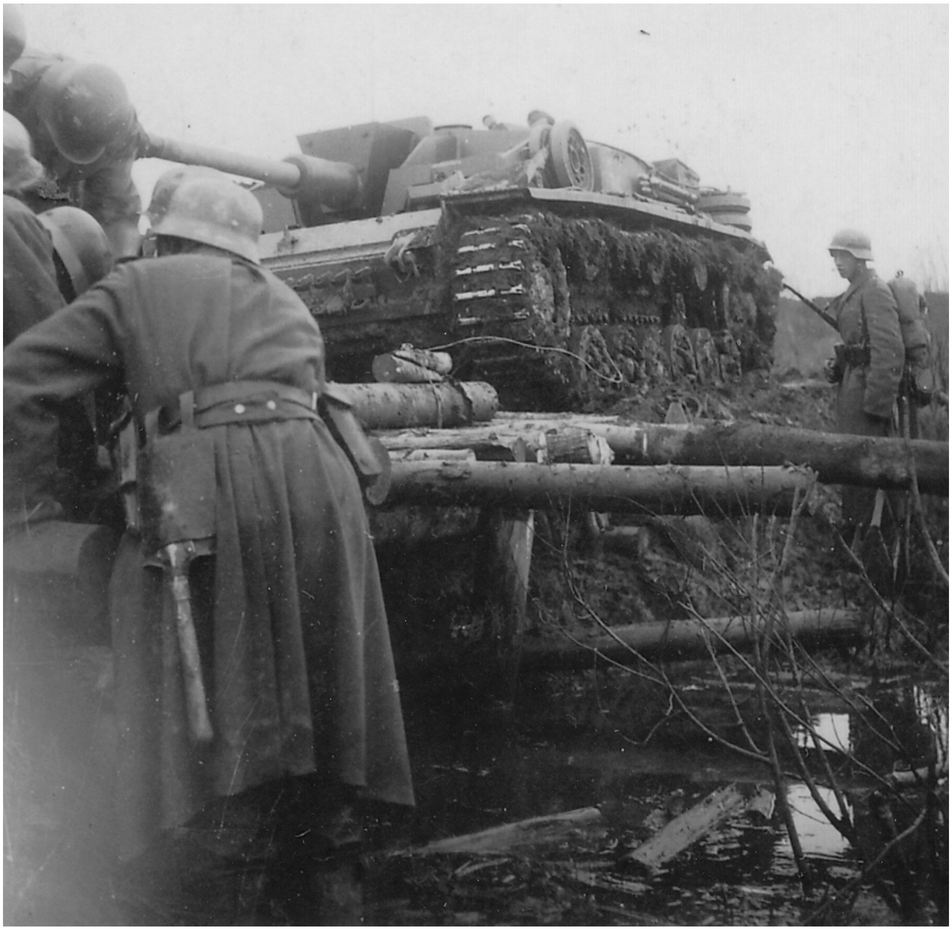
Production of the improved version, designated Ausf F, replaced the Ausf E after some 284 of the planned 500 had been built. The change in production took place in February/March 1942, and by September 1942 366 Ausf F had been manufactured. In the first months of the *Langrohr* entering service another name emerged with the troops – *Sturmgeschütz* 40, possibly referring to the 7.5cm StuK 40 gun. However, the official designation *Sturmgeschütz* III remained. The latter term became necessary after the hull of the PzKpfw IV was used to produce an assault gun (*Sturmgeschütz* IV).

After the production of 120 Ausf Fs mounting the 7.5cm StuK L/43, the length of the gun barrel was increased to 3,855mm (L/48). The new gun was immediately introduced on the production lines.

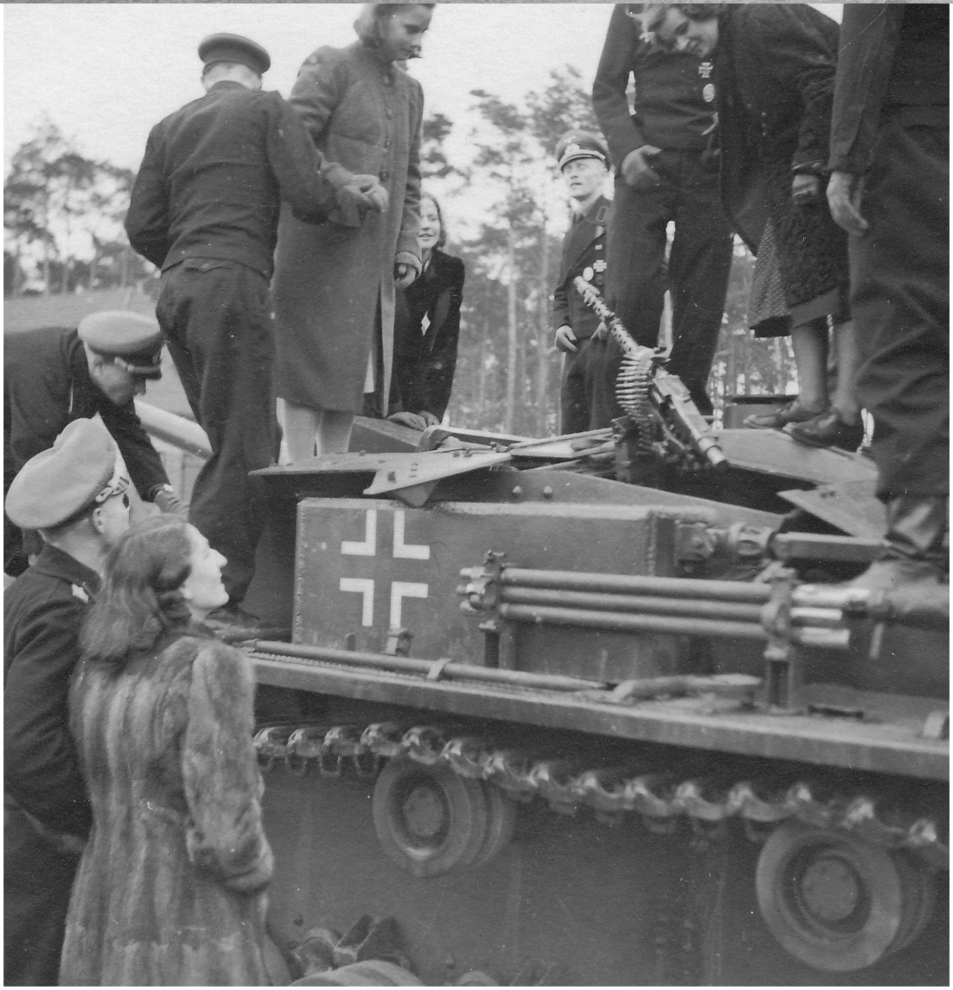
Improving the Armour Protection

During production of the Ausf F, a discussion began on how to increase the frontal armour protection on both the *Sturmgeschütz* and the PzKpfw IV. Hitler had personally demanded this development, as confirmed in surviving *Führerprotokolle* (notes made by Albert Speer, *Reichsminister* of Armaments, after his discussions with Hitler). The *Führer* made his demands during several meetings, intervening in almost every matter:

> 7 May 1942
> 39.) It has to be immediately examined as to whether the frontal armour of the *Sturmgeschütz* can be reinforced to 80mm.
>
> 13 May 1942
> The *Führer* again demands an immediate solution, initially by welding on *Vorpanzer* [add-on armour]. He puts emphasis on the fact that any reduced mobility caused by the extra 450kg weight is acceptable.



A late production *Sturmgeschütz* Ausf F fitted with the 7.5cm StuK 40 L/48 gun carefully crosses a simply constructed wooden bridge. During production, the frontal armour was increased by welding additional 30mm plates to the front of the hull and superstructure. The vehicle is from StuGAbt 203, called *Elefant-Abteilung* after their unit badge. (Anderson)



During 1942, the establishment of new units continued at Jüterbog. During an open day, visiting civilians have the opportunity to take a closer look at a *Sturmgeschütz* Ausf F. Quite unusually, a *Maschinengewehr* (MG) 34 has been mounted in front of the commander's hatch, and a *Selbstfahrlafette-Winkelspiegel* (periscope sight for SP guns) has been fitted in place of a *Scherenfernrohr*. (NARA)

> 4 June 1942
> The increase in armour protection to 80mm for both *Sturmgeschütz* and Panzer IV has to be accelerated. The projected date of mid-July is too late.
>
> 23 June 1942
> The *Führer* has decided that the *Sturmgeschütz* will be provided with *Vorpanzer*.
>
> 13 August 1942
> The *Führer* emphasizes that all PzKpfw IV and *Sturmgeschütz* being sent home for general overhaul shall be fitted with the new long gun.
>
> [Speer made a further remark on the *Sturmgeschütz*: Difficult to execute: Cutout at the front and roof section, ventilators, ammunition storage – everything is different.]

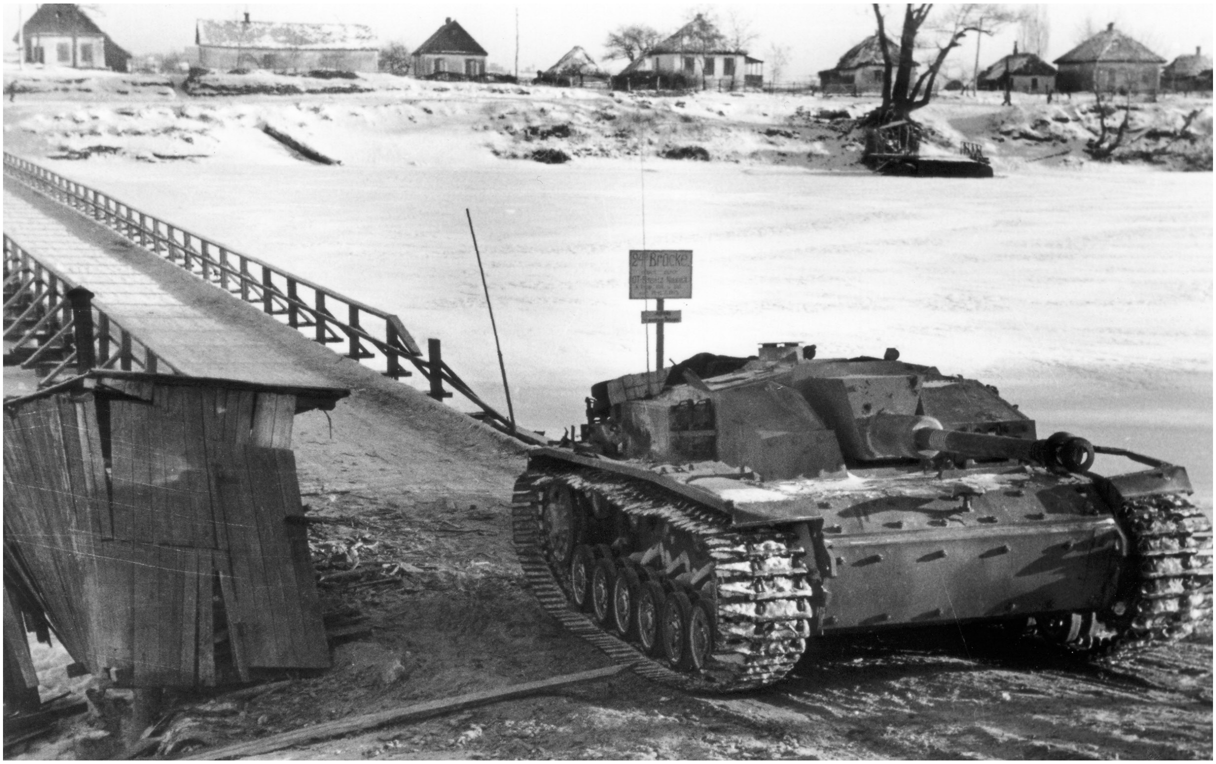
The up-armouring programme was introduced during production of the Ausf F production line. For this, extra 30mm thick armour plates were welded to the hull and the front of the superstructure.

After 366 Ausf Fs had been delivered, production ended and a new version of the PzKpfw III was introduced. This, designated by the manufacturer as the 8./ZW, had a slightly modified hull which would be used for all future *Sturmgeschütz* production. By December 1942, some 250 *Sturmgeschütz* Ausf F/8 (the designation given to the 8./ZW) had been completed. All production Ausf F/8s were fitted with 30mm add-on armour, which at first was welded on, but later bolts were used.

Deliveries

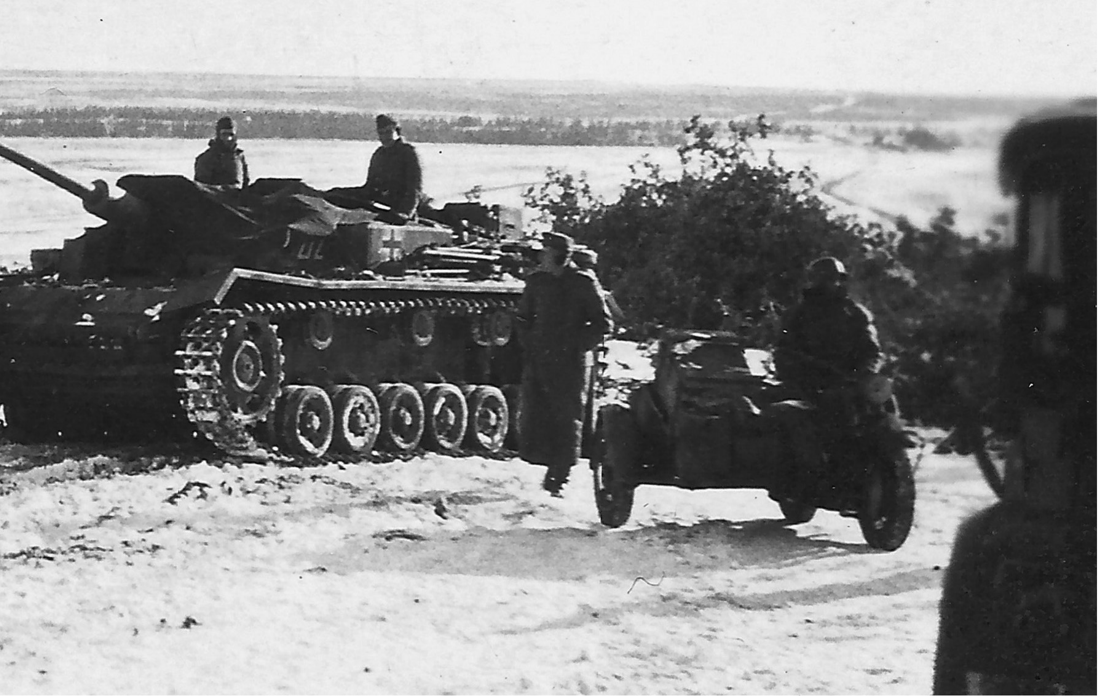
The first unit to be equipped with the new *Langrohr* was StuGAbt *Großdeutschland*. Its predecessor, *Infanterie-Regiment Großdeutschland* (IRGD) was supported by *Sturmbatterie* 640 during the French campaign of 1940, and the battery was to remain in this unit as 16.*Sturmgeschutz-Kompanie* (StuGKp/IRGD). This was not usual, as the majority of *Sturmgeschütz* units remained at army level and were subordinated only temporarily to other infantry or tank units according their tactical requirements.

In early 1942, it was decided to upgrade the *Großdeutschland* to an infantry division. For this reason 16.*Sturmgeschütz-Kompanie* was also to be upgraded to an *Abteilung*, which required StuGAbt 192 to be amalgamated with 16.StuGKp/IRGD. In March 1942, StuGAbt 192 was released from the front, and all personnel were transported back to the Reich without their equipment, which was distributed to other units. StuGAbt 192 was



StuGAbt 901 was established in December 1942, and was immediately sent to Stalingrad in an attempt to relieve encircled German units. All were the Ausf F/8 variant with bolted add-on armour and fitted with *Winterketten* (winter tracks). Despite being sent into the conditions of the Russian winter, all vehicles had been delivered in tropical camouflage. (StuArt archive)

disbanded in April 1942, and in the same month all the men were sent to Jüterbog, where StuGAbt *Großdeutschland* was in the process of establishment. In accordance with KStN 446, dated 1 November 1941, the unit was to be equipped with seven StuG Ausf Fs to each battery. The *Abteilungskommandeur* (battalion commander) was also to be provided with a *Sturmgeschütz*.



Left: Two *Sturmgeschütz* Ausf Fs, mounting the L/48 gun, from StuGAbt 191 during the winter fighting for a bridgehead in the Kuban Oblast. (PeKo)

Below left: A *Sturmgeschütz* of the *Mühlen-Abteilung* (the unit used a windmill on its badge). The newly-delivered Ausf F/8 has been fitted with *Winterketten*. The antennae for the radio equipment are now rigidly mounted. (StuArt archive)

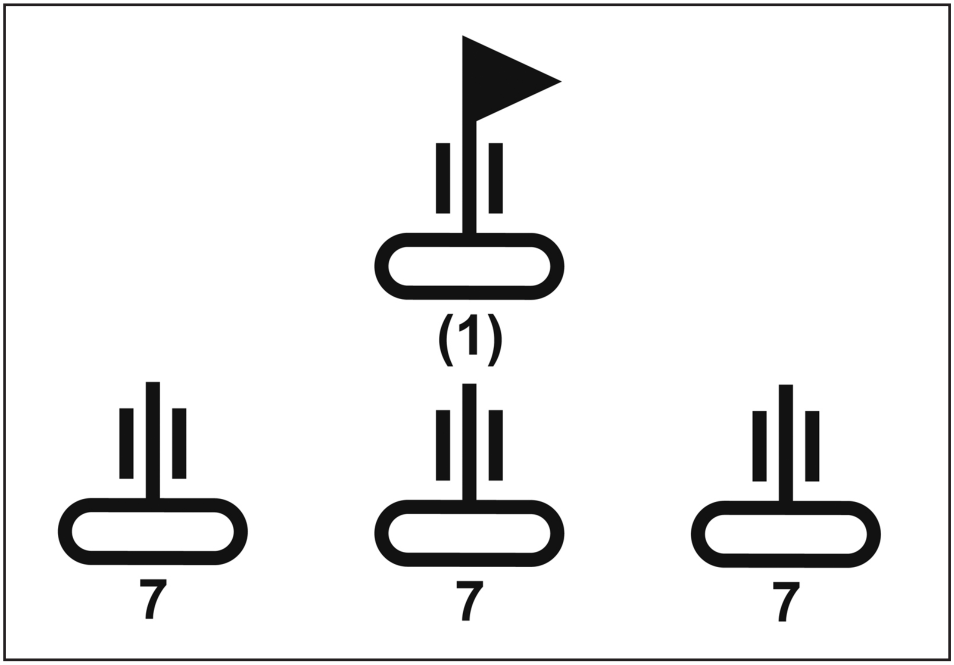
This measure ensured sufficient numbers of *Sturmgeschütz* in the lead unit, as it was originally planned (one *Abteilung* per division). However, I*nfanterie-Division Großdeutschland* (IDGD) was one of the few units chosen to be permanently provided with a complete StuGAbt.

It is worth noting that in mid-1942 all front-line *Sturmgeschütz* units received *Langrohr Sturmgeschütz* in limited numbers and then only as replacements for destroyed vehicles. As the year progressed most units had a mixed establishment, of which many were the older *Kurzrohr* (short-barrelled) type, a situation that lasted into 1943. Only newly established units or those withdrawn from the front line for rest and replenishment would be reformed with up to 22 long-barrelled *Sturmgeschütz* in accordance with the current KStN.

At the time of its establishment, StuGAbt GD was ordered to test the new *Sturmgeschütz* 40 when it was delivered to Jüterbog. From the experience report covering April 1942 to June 1942:

> 1 May 1942
> The first firing trials with the *Sturmgeschütz* 40 on the range at Jüterbog: Present are *Oberst* Kadgien, artillery school Jüterbog, *Oberleutnant* Hoffmann-Schönborn, commander 3./ALR2 (mot), *Oberleutnant* Weiss and some engineers from the *Waffenamt* A.
>
> Reason for the test firing:
>
> 1.) Trial of the recoil brake and breech-block system.
> 2.) Examination of cartridge jams, as occurred during tests with the Krupp gun.

In November 1941, it was planned that all *Sturmgeschütz-Abteilung* should have a complement of 21 or 22 vehicles.



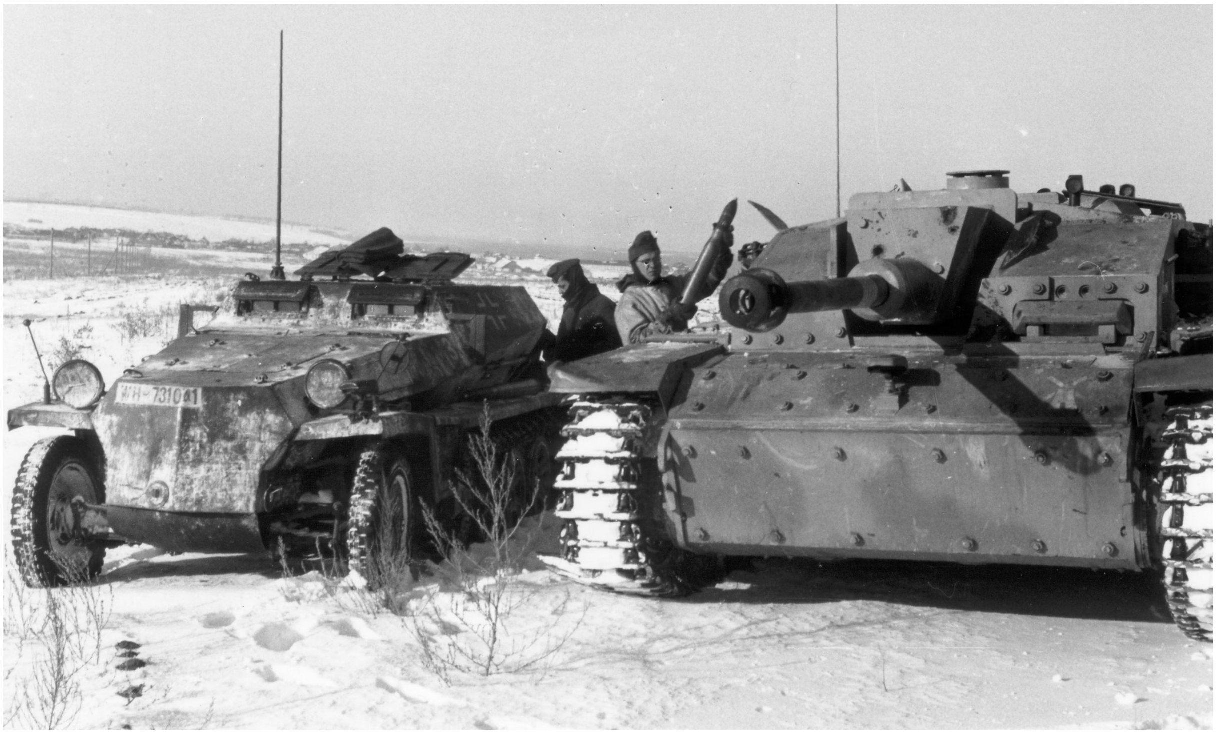
Available ammunition:
66 rounds of SprGr Patr 34 HE rounds and 150 *Anschussknüppel* [dummy rounds] without a warhead but having the same propellant charge as the PzGr Patr 39. The test firing results in repeated jams with the *Anschussknüppel* only. It is assumed that the ejector mechanism does not work correctly. A second test firing is planned.

9 May 1942
Second test firing. Present are *Oberst* Kadgien, *Oberleutnant* Dr Ernst of Insp IV, *Baurat* Seelhand and Krupp, the manufacturer of the breech mechanism.

Available ammunition:
A total of 495 *Anschussknüppel*, of which 250 had been heated to 32/35°C, were used. Again jams occurred, especially with the heated ammunition. It is assumed that the gas pressure of the propellant is too high. Conclusion: Firstly the ejector and the breech block parts are to be redesigned.

14 May 1942
Major Schepers travelled to Kummersdorf to attend the test firing by a *Sturmgeschütz* 40 using cartridges filled with *umlaborierter-treibsatz* [reformulated] propellant. Further tests prove that more work on the propellant to achieve a weaker gas pressure is necessary.

It is obvious that the problem with the propellant of the PzGr 39 could be solved. The report shows how technical progress develops even under time pressure.



The windmill badge of *Muhlen-Abteilung* is clearly visible on this *Sturmgeschütz* Ausf F/8. The vehicle, which has the extra 30mm bolted-on armour, is painted in sand yellow and grey-green camouflage.
The presence of an SdKfz 252 with this unit, which was established at end of 1942, is a mystery since production of the type ended in September 1941. Perhaps it was a surviving vehicle or one that had been refurbished and re-issued.
(StuArt archive)

Improved Radio Equipment

This report from StuGAbt GD also contained information on the changes to the radio equipment within the *Abteilung*. These were necessary due to the increasing of the numbers of vehicles in the *Abteilungen*, and the expansion of combat missions.

By 1941, all *Sturmgeschütz* had been fitted with the Fu 16 radio (10W S 'h' short-wave transmitter) and Fu 15 UHF E 'h' (ultra-high frequency receiver) installed, to allow full radio contact within the battery. When the Ausf E entered service, it was now possible to have an additional Fu 15 installed in a platoon and battery leader's vehicle, which allowed all the battery's radio traffic to be continuously monitored. The long-range Fu 8 radio set (30W S short-wave transmitter with an Mw E 'c' medium-wave receiver) was used to keep contact with command and the supply echelons. This radio equipment was normally carried in soft-skinned vehicles of the *Nachrichtenstaffel* (signal section) of the battery's staff section or the *Abteilung* staff battery. From early summer 1942, it was decided to allot a *Sturmgeschütz* to the *Abteilungskommandeur*. This decision also applied to all newly-established *Abteilungen* and those being re-equipped in the Reich: exact numbers are not known. It was now possible to install a Fu 8 long-range radio, along with a standard Fu 16 radio in a *Sturmgeschütz*. As noted in a training leaflet, published by the *Sturmartillerie-Schule* in 1944, it was standard practice to install the Fu 8 in the battery commander's

Armoured ammunition carriers were popular with *Sturmgeschütz* units, but the bodywork only provided protection against infantry fire and artillery shrapnel. The SdKfz 252 was originally designed to carry 64 rounds of 7.5cm L/24, but it is thought that crews removed the stowage racks to allow the carriage of the longer L/48 ammunition. (StuArt archive)

cross-country car. However, although it was physically possible to install this radio equipment in a *Sturmgeschütz*, it was the commander's responsibility to make the final decision. StuGAbt GD was apparently provided with a command *Sturmgeschütz* as part of its original establishment. The report continues:

> 18 May 1942
> A radio exercise which took place north of Treuenbrietzen involved the entire *Abteilung* … Four new *Sturmgeschütz*, which can carry the new 30W radio, have been delivered. This radio allows the *Abteilungskommandeur* [battalion commander] to keep in contact with his batteries at ranges of 60km (voice transmission) and 100km (Morse transmission). These four *Sturmgeschütz* are to be used by the *Abteilungskommandeur* and the *Batteriechef* [battery leader]. Four wrongly allocated *Sturmgeschütz* have been delivered to 3./ALR (mot) at Adolf Hitler Camp, Jüterbog.

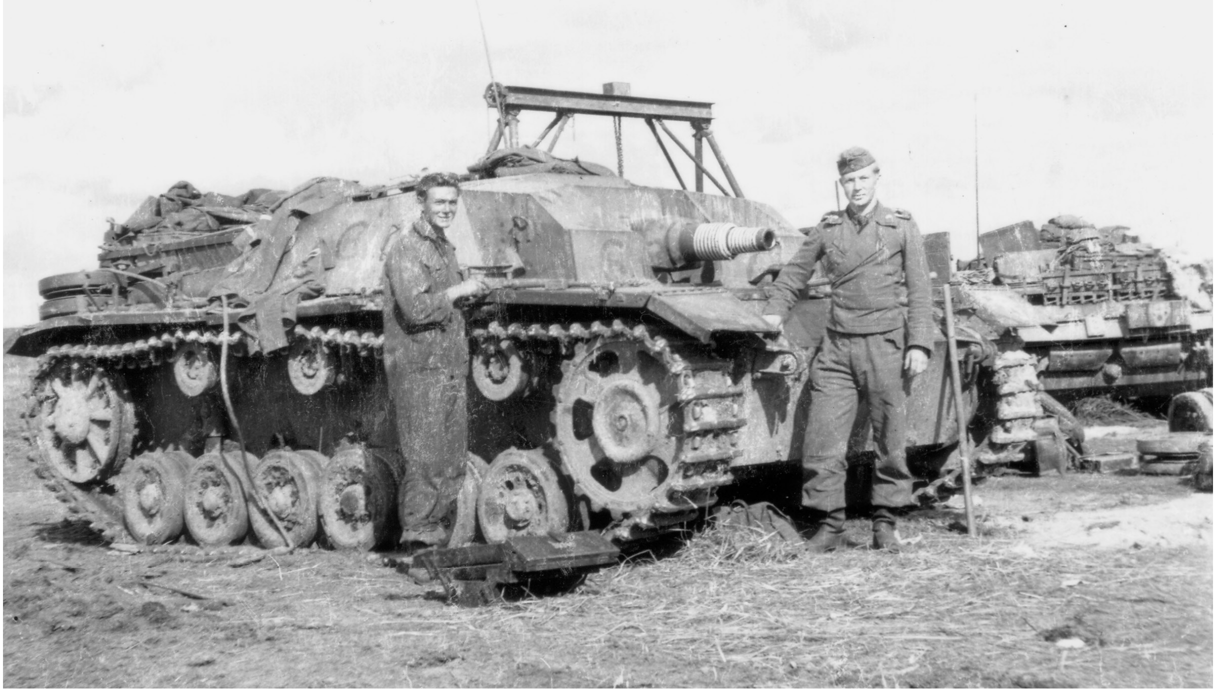
Possibly this was a report on a trial to test the new communications under battlefield conditions.

While the Fu 16 (as the Fu 15) relied on a simple 2m *Stabantenne* (rod aerial), the Fu 8 needed a more sophisticated aerial. The earlier types used as command tanks by the *Panzertruppe* were easily recognizable by the heavy frame-type antenna mounted over the engine deck. In 1942, a much better type, the *Sternantenne* d (a rod-type aerial with a much less conspicuous star-shaped top) became available. For technical reasons the *Sternantenne* d required a (fragile) porcelain isolator at the base of its mounting, which was protected by a *Panzertopf* (armoured protective cover). The *Sternantenne* was normally mounted at the right-rear side of the superstructure above the Fu 8. Occasionally, some vehicles with both a 2m *Stabantenne* and a *Sternantenne* can been seen in contemporary photographs.

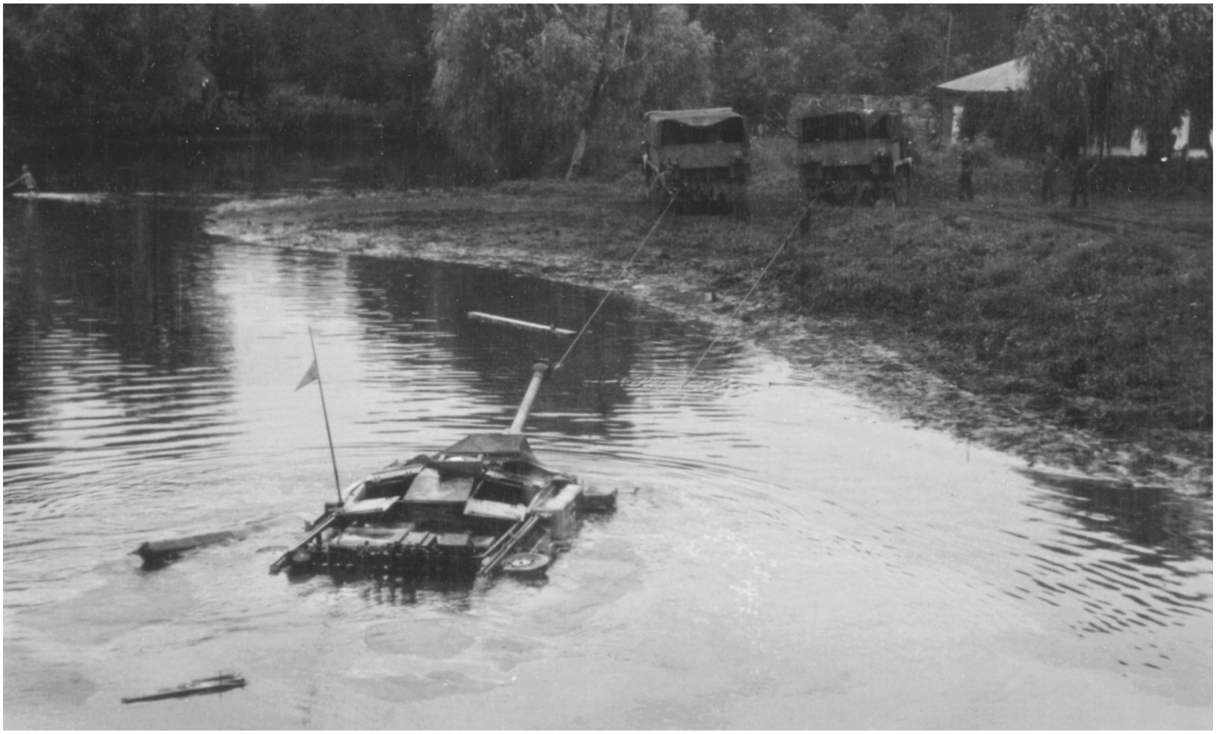
StuGAbt 197 in the Crimea

At the end of 1941, the Crimea was occupied with only the fortress Sebastopol remaining under Soviet control. On 5 December, the Kerch peninsula was liberated after a series of fierce Soviet counterattacks. The only *Sturmartillerie* unit available to German forces was StuGAbt 197. An after - action report submitted on 2 April 1942 said:

> Experience report from the *Abteilung* in regard to combat against Russian tanks during fighting on the Kerch Peninsula in March 1942:
>
> The *Abteilung* was deployed in the defensive line with two operational batteries. During our defence against numerous heavy enemy assaults by light, medium and heavy tanks on 13 to 16, and 19 March, the *Abteilung* made a great contribution by destroying 70 enemy tanks… The *Abteilung* was for the first time deployed as defence against massed tank assaults, and gained the following experience:



A *Sturmgeschütz* Ausf B of StuGAbt 210 has survived, almost intact, until the summer of 1942. Battered vehicles like this were known as *Zigeunerwagen* (gypsy wagon). The crew has painted more than 15 kill rings around barrel as evidence of their score in recent fighting. The two *Sturmgeschütz* are being overhauled by the workshop company. Note the gantry crane in the background. (Anderson)

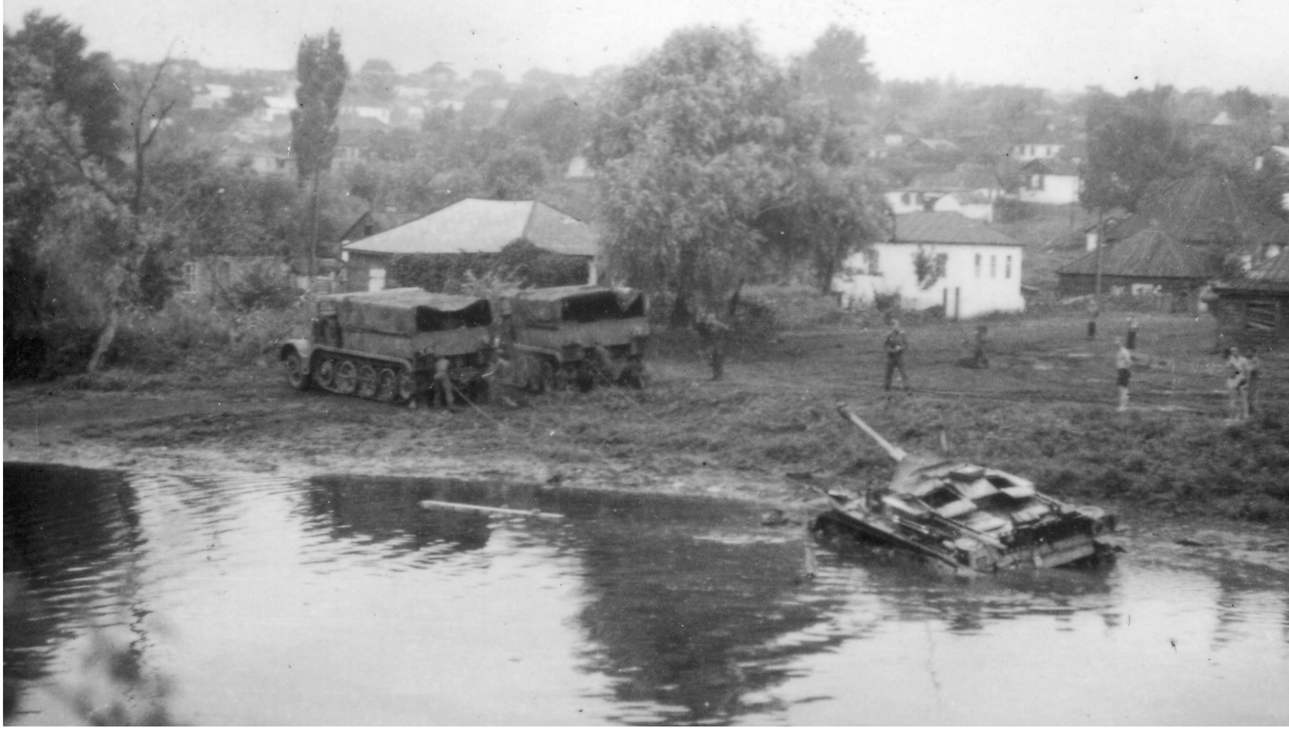


A *Sturmgeschütz* Ausf F of StuGAbt 210 which has flooded and stopped while crossing a river. Two Famo SdKfz 9 heavy halftracks, from the recovery section, use winches to haul the assault gun slowly back to the safety of the river bank. The heavy halftrack was considered to be an almost 'precious' vehicle by recovery teams, but it was always in short supply. (StuArt archive)

1.) Commitment of *Sturmgeschütz* in defence:
Sturmgeschütz as dedicated attack weapons have in general to be used with caution in defensive situations. If the enemy achieved a break through of our front line, they were used to support counterattacks. However, due to the reduced numbers of our own infantry in comparison to the enemy's far superior infantry forces, these counterattacks were not successful. For this reason our *Sturmgeschütz* were deployed as the smallest unit (a platoon, each with three *Sturmgeschütz*) immediately behind the *Hauptkampflinie* [HKL – main line of resistance]. They had the task of halting any attempted break through by enemy tanks or infantry.

3.) Deployment:
Each day, the platoons advanced before sunrise to their jump off positions behind the HKL, and returned after sunset. There were never any losses to enemy fire during these movements… The platoon will be moved into covered positions with the command vehicle far at the front, the others staggered over 200 to 300m to the rear.

4.) Combat:
In combat the platoon leader has to get his platoon – commands sent via radio – on to the flanks of attacking enemy tanks, without regard to their own flanks… This was favourable due to the inadequate observation means in the Russian tanks… Fire has to be opened at ranges of 800 to 1,000m, and has to be rapid

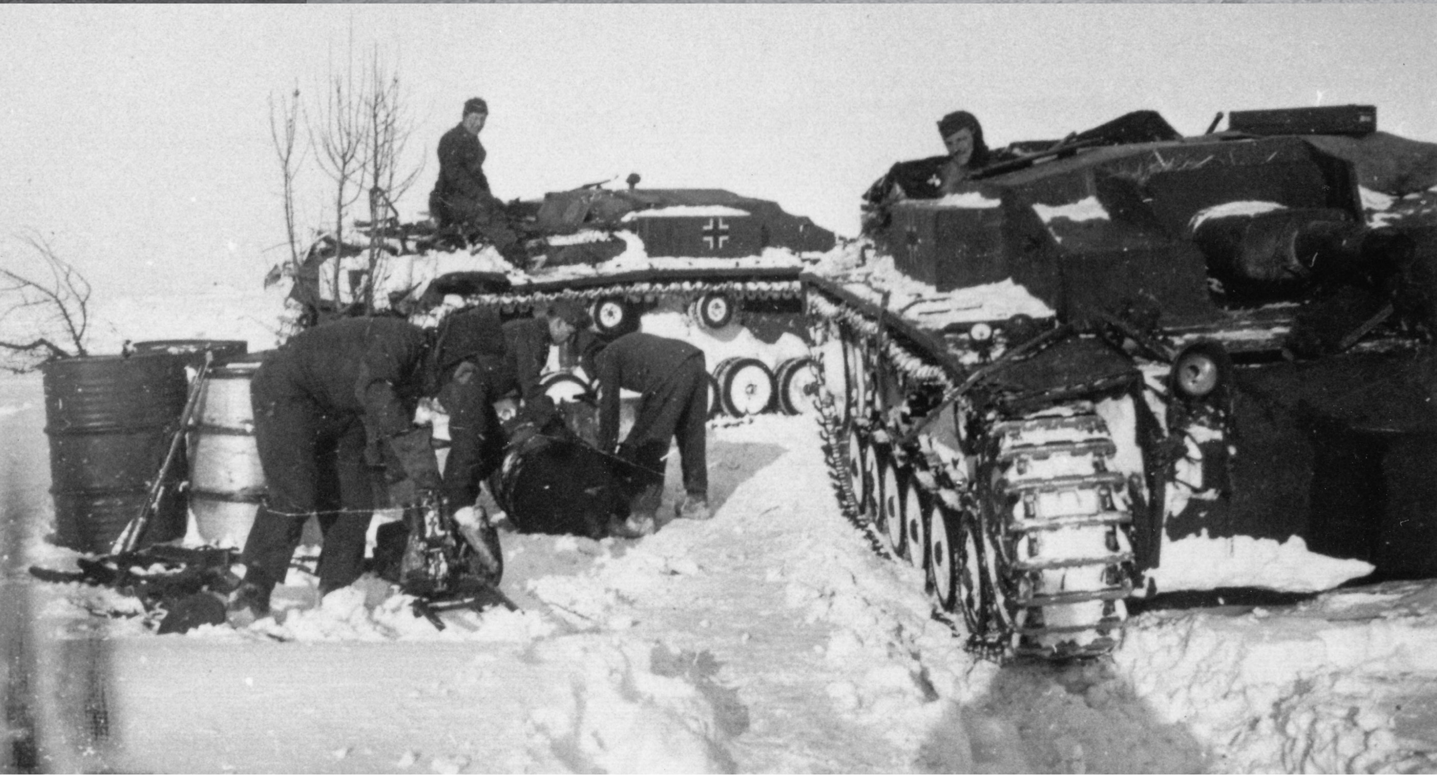


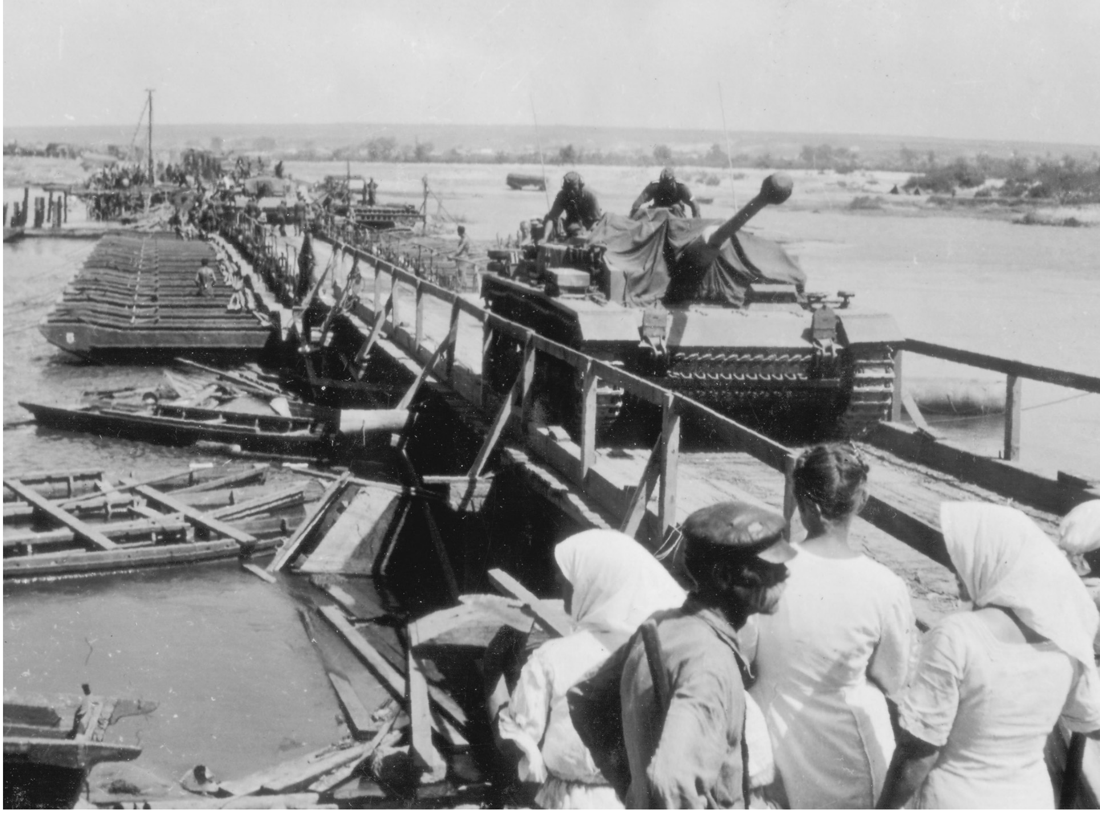
The recovery action is almost over and the vehicle will now be taken away for repair as every serviceable *Sturmgeschütz* was desperately needed due to the poor supply situation. The vehicle being recovered carries a pennant on the left-hand radio antenna, an item rarely seen on German armour. (StuArt archive)

and very accurate. The Russian T-34 can fire one round with poor accuracy while a *Sturmgeschütz* can fire three to four rounds in the same time. If a *Sturmgeschütz* comes under fire from a T-34 or a super-heavy tank, a change of position using smoke cover has proved to be successful. If possible, another *Sturmgeschütz* will continue the combat.

5.) Conduct of our infantry:
A prerequisite for the success of defence is that the infantry will by all means maintain their position in the HKL even if a single Russian tank has broken through. The Russian infantry accompany their tanks only during the initial phase of the assault which always results in high losses (many caused by ricochets from *Sturmgeschütz* fire).

6.) Method of fire and ammunition:
During the massed tank attacks, fire was normally opened at a range of 600m. Occasionally the Russian tanks stopped at ranges of 1,000 to 1,200m to open fire. Quite naturally in such situation any approach by a *Sturmgeschütz* in open terrain was impossible… We attacked the T-34 by bracketing with HE rounds first. Fire for effect was then opened with GrPatr 38 at 600 to 800m. Effect: Total destruction of the running gear and fire in the tank's interior which caused the death of the crew… Attacking a Soviet super-heavy tank at a range of 1,200m caused some damage but did not immobilize it… Ammunition consumption was very high, since there is enemy infantry





Above: Two *Sturmgeschütz* Ausf E of StuGAbt 245 being replenished with fuel in the field during the winter of 1943. From June 1942, the unit was deployed for *Fall Blau*, the advance to the Caucasus. By the end of 1942, the unit was engaged in heavy fighting to the north of Stalingrad. Since there was no time for re-equipment, the unit had to continue to use *Kurzrohr*-mounted vehicles. (Anderson)

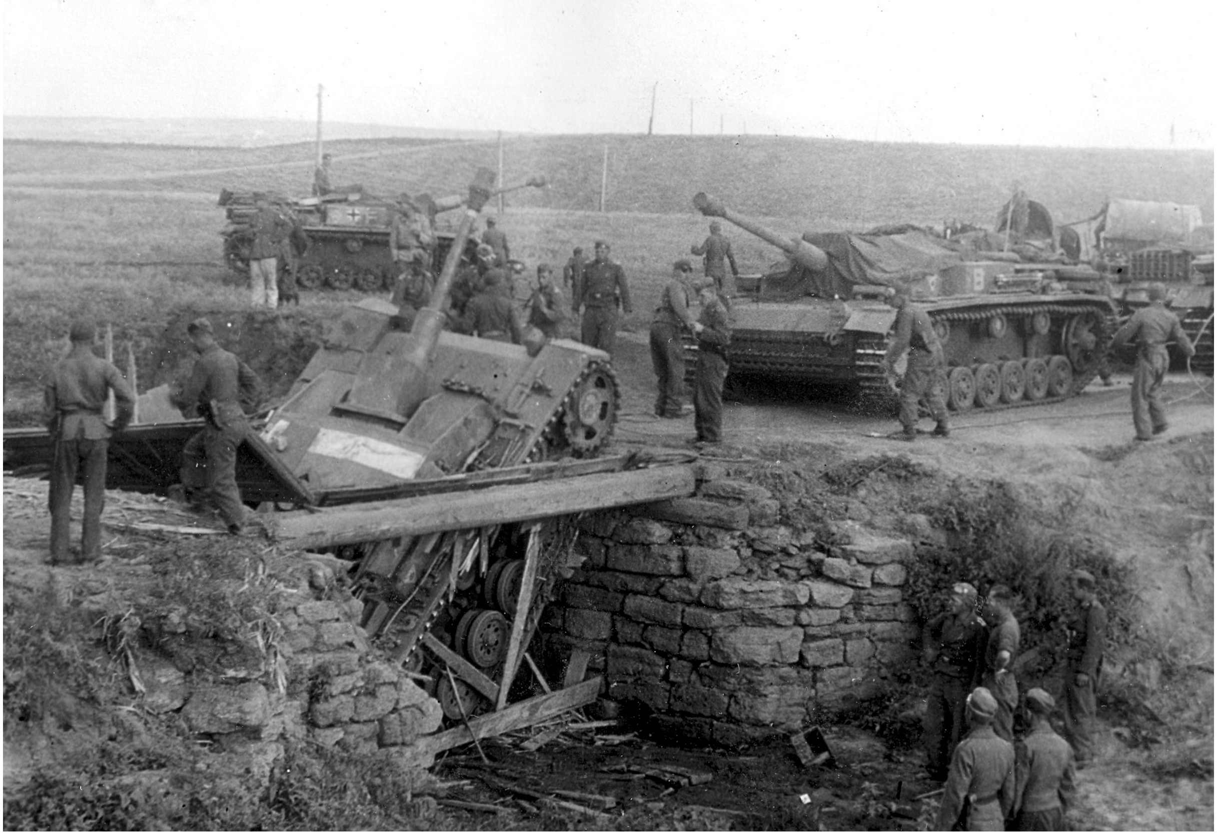
Right: *Sturmgeschütz* of StuGAbt 210 crossing a pontoon bridge over the river Kuban, near to the city of Krasnodar. The pontoon bridge was a strategically important piece of equipment. (StuArt archive)

> to target, also anti-tank and artillery guns to be eliminated. After each commitment the *Abteilung's* last surviving SdKfz 252 was constantly on the move supplying ammunition.
>
> 7.) Summary:
> In most cases, even a massed enemy tank attack can be repulsed by a platoon of three *Sturmgeschütz*, but this required careful tactical leadership and a sufficient ammunition supply. To surprise the opponent, it is crucial to use quick and accurate fire against his flank… The platoon leader and his platoon have to be thoroughly trained for this type of attack. Our crews are unperturbed in the face of an attack by numerically superior Russian tanks.

During a few days of fighting, some 70 Soviet tanks had been destroyed by a small number of *Sturmgeschütz* without loss, which only went to reinforce the legendary reputation of the *Sturmartillerie*.

In order to stabilize the situation on the Kerch Peninsula, *Generaloberst* von Manstein, commander of 11.Army, ordered Operation *Trappenjagd* (Bustard Hunt). Again the German war machine showed its skills. On 8 May 1942, German forces consisting of the 22.PzDiv and five infantry divisions supported by Romanian forces attacked from the south. Again StuGAbt 197 was part of this force. The official experience report of 11.Army stated:

> The break through at Parpach:
>
> Preliminary note:
> Reading these notes it should be clear that the army had plenty of time during the defensive battle to make exact preparations. Enemy positions and the terrain were very thoroughly reconnoitred, providing very accurate information. This would not be possible for an attack against similar objectives launched during a battle situation.
>
> IV.) Performance of the weapons:
>
> 6.) The *Sturmgeschütz* have performed outstandingly well in the difficult terrain [snow and mud] by effectively supporting the assault. They have provided support fire for our pioneers when clearing mines and erecting a bridge over an anti-tank ditch.
>
> 8.) Our infantry divisions lacked suitable weapons to fight enemy tanks. During the breakthrough at Parpach those *Sturmgeschütz* units subordinated to the infantry divisions carried the burden of combating enemy tanks, when our Panzers were not available.
>
> The *Sturmgeschütz* armed with *Langrohr-Kanone* L/41 has proved to be successful at ranges of 800 to 1,000m. If the rounds did not hit the target straight on, ricochets were often observed. A supply of HE rounds is urgently desired to enable the *Sturmgeschütz* armed with *Langrohr* L/41 to perform their original task.



Above: Due to the lack of SdKfz 9 heavy halftrack recovery vehicles, a *Sturmgeschütz* could be called on to tow a failed or wrecked vehicle. The white stripe painted on the roof plate is of interest; possibly it is an air recognition mark for *Luftwaffe* identification. (StuArt archive)

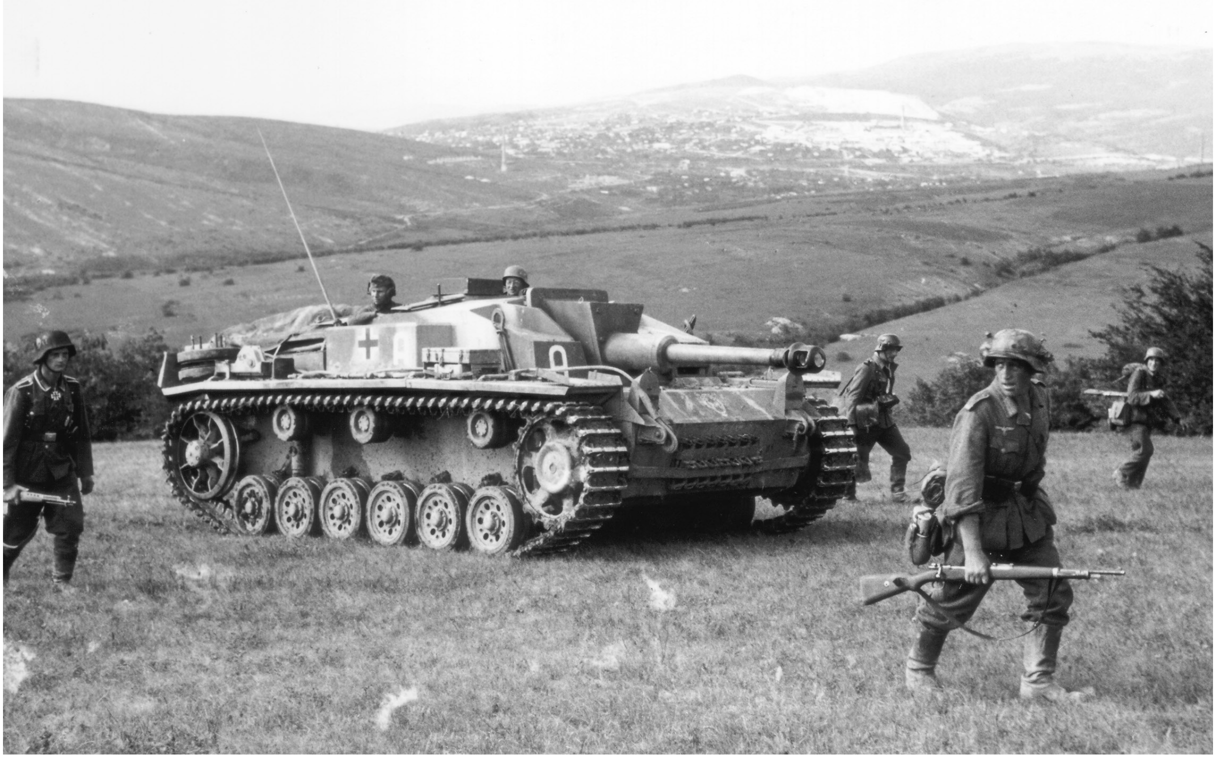
Left: The crew of this *Sturmgeschütz* Ausf F of StuGAbt 210 clearly overestimated the load-bearing capacity of this small wooden bridge. The vehicle is at such an angle that recovery will be a very difficult operation and damage can be expected to the rear idler wheel mountings. (StuArt archive)

Although interesting, mystery surrounds parts of this report. Operation *Bustard Hunt* took place between 8 and 20 May, and it is not certain if delivery of *Sturmgeschütz* Ausf F L/43 *Langrohr* had begun that early. Possibly the use of *Langrohr* L/41s was the result of a typing or clerical error. It has been noted in several different sources that StuGAbt 203 lost three assault guns and 22.PzDiv some eight tanks. Soviet losses were disproportionally higher with an estimated 250 tanks destroyed.

Langrohr – First Combat

A very detailed after-action report from StuGAbt *Großdeutschland* details the performance of the new gun:

> Experiences:
>
> From the commencement of combat up until 7 July, the new long-barrelled *Sturmgeschütz* 40, which was deployed on the *Ost* [East] front for the first time, has proven to be outstandingly successful. In the period from 28 June to 7 July, some 910 HE rounds and 431 PzGr were fired. The performance using HE rounds is identical to that of the old gun, a direct hit on specific target could be achieved at up to 800m range. The impact of the new PzGr 39 was surprisingly good. All Russian tanks including the KV-1 were clearly penetrated at 600m range. Even the T-34, the hardest tank to defeat, was destroyed by clear



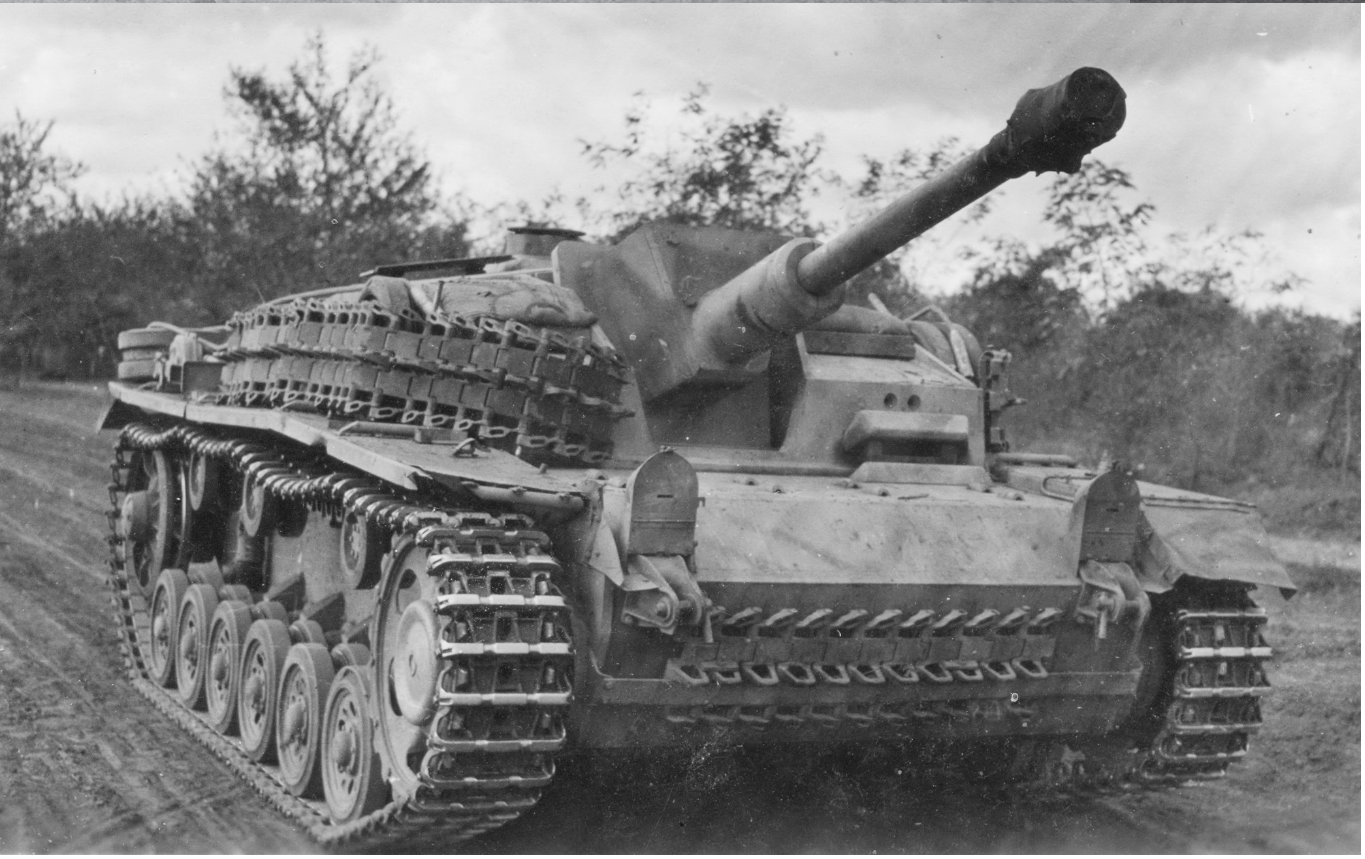
A *Sturmgeschütz* Ausf F armed with the 7.5cm StuK 40 L/43 during a demonstration for the photographers of a *Propaganda-Kompanie* (PK – Information Company). The infantry escort the advancing *Sturmgeschutz* in a ‘textbook’ manner. (StuArt archive)

> penetrations, despite having sloped armour on the front, turret and sides. Thus the *Abteilung* has a weapon with which it can look forward with confidence to the coming fighting, quite contrary to our experiences in the summer and winter of 1941. During the period 28 June and 7 July, the *Abteilung* destroyed 41 Russian tanks of all types. Despite the problems which had been found at Jüterbog, no further cartridge jams occurred, even when they were heavily coated with dust.
>
> Unfortunately, the small amount of ammunition available, especially HE rounds and the low supply (a fact known by higher command) forces us to use it very sparingly.

This report creates a strong contrast to the experiences noted in 1941. However, the vast majority of StuGAbt were still equipped with older *Kurzrohr*-type vehicles. In mid-1942, StuGAbtGD was the exception, by having a full complement of the precious *Langrohr Sturmgeschütz*. [Author: It is not known why the report does not mention the PzGr 40.]

On 9 February 1943, the high command of 16.Army (AOK 16), *Heeresgruppe Nord* made a report on the last six months of 1942.

> *Sturmgeschütz* 7.5cm *kurz*
> One KV-1 was destroyed by jamming the turret with direct fire from a *Sturmgeschütz* 7.5cm *kurz*. Several T-34s were also destroyed. Until now the penetration power of the *Sturmgeschütz* was only sufficient to defeat light and medium tanks (T-60, T-26). This action shows that possibly the quality of Russian armour has been reduced.

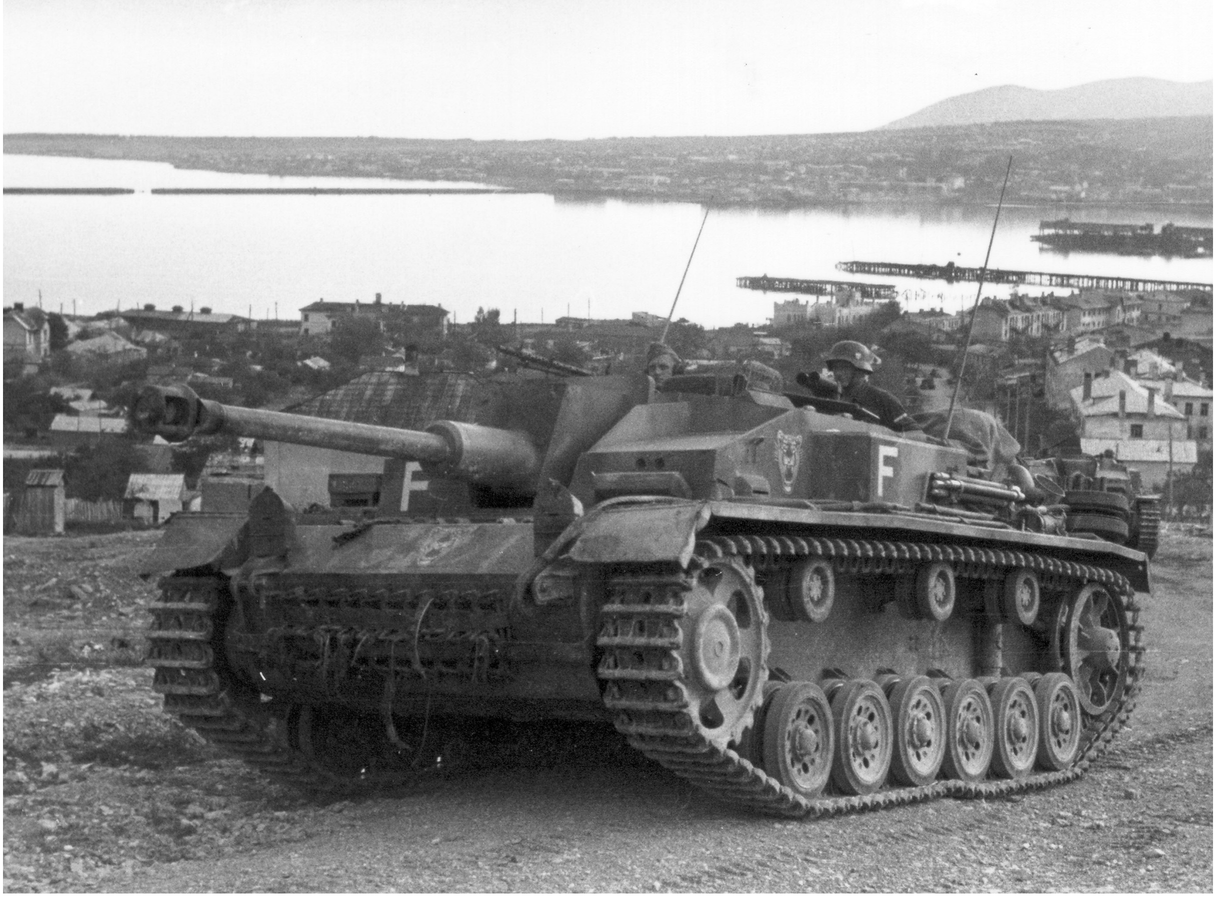


The crew of this *Sturmgeschütz* Ausf F of StuGAbt 191, mounting a 7.5cm StuK 40 L/43, has added items to improve survival under battlefield conditions. Very long sections of spare track have been packed around the side panniers and sand-filled sacks have been placed each side of the gun to close bullet traps. (Anderson)

This was based on a report submitted by StuGAbt 185 dated January 1943:

> To *Heeres Waffenamt*
> Changes observed on Soviet armour.
> With regard to our combat against Russian tanks during defensive fighting southeast of Lake Ilmen since 28 November 1942, the *Abteilung* made the following observations:
>
> The *kurzrohr*-equipped vehicles fired at all types of Russian tanks, including KV-1 and T-34. After two to three hits the majority of them caught fire.
>
> During the summer [1942], the destruction of a T-34 using a *Kurzrohr* gun was a very rare and difficult occurrence. As an example, setting fire to a T-34 required 83 rounds to be fired. In all cases HL ammunition was used.
>
> Furthermore, we noticed that direct hits broke off large pieces of the tanks armour. The same observation was made with StuK 40 equipped vehicles firing PzGrPatr 39.
>
> The *Abteilung* has concluded that this can only be explained by a change in the quality of Russian armour.

This report explains the problems experienced by German armour of that time, until introduction of the *Sturmkanone* StuK 40. However, the question as to whether the Soviet arms industry was producing inferior quality steel armour during this period cannot be answered.



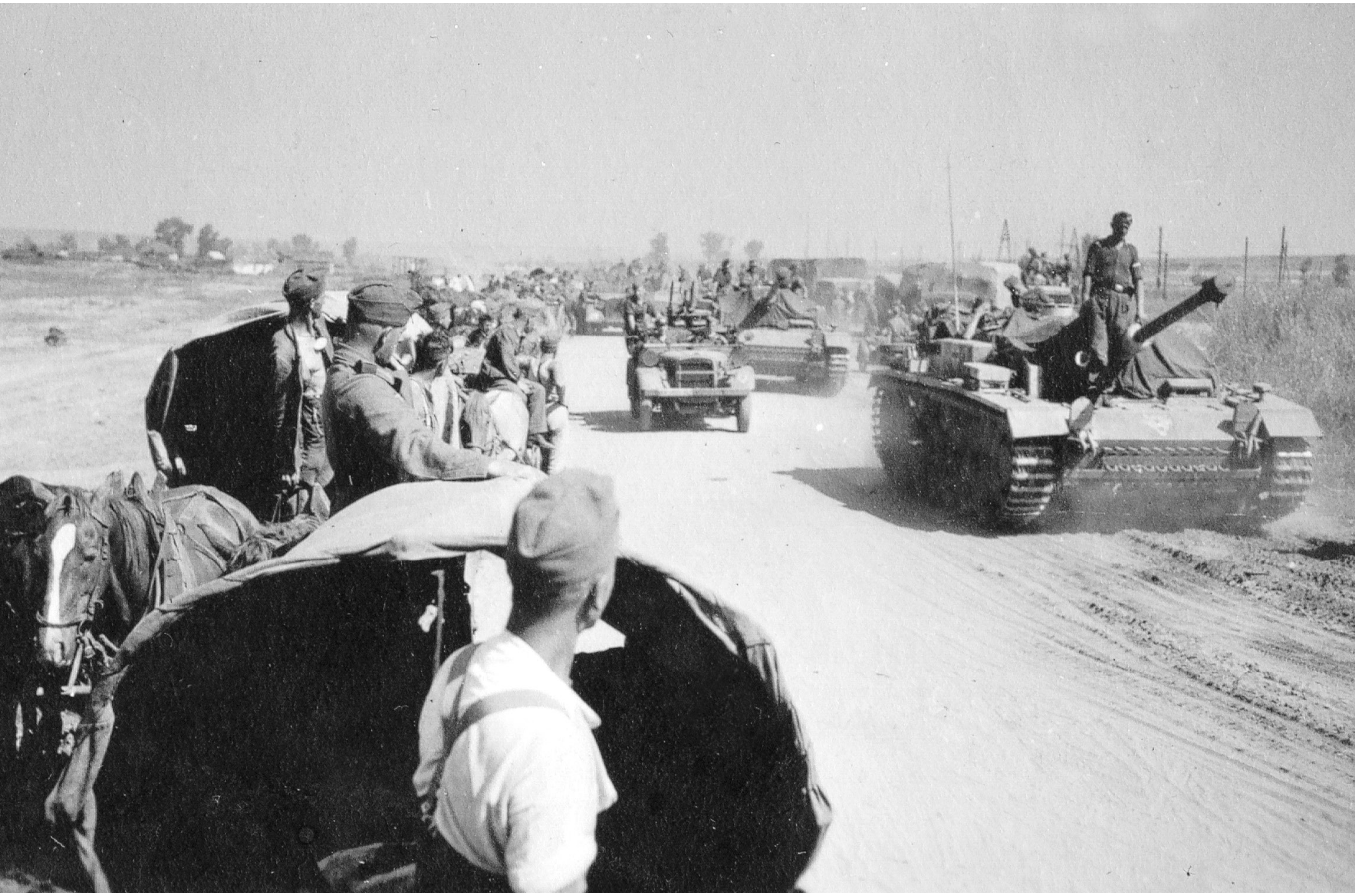
A *Sturmgeschütz* Ausf F of StuGAbt 210, with the tiger's head emblem of the unit stencilled on the front and side of the superstructure. The large letter is used to indentify an individual vehicle in the battery. It is interesting to note that this unit did not try to enhance the armour protection on its vehicles. (StuArt archive)

Advance to Stalingrad

The fighting for control of the beleaguered city of Leningrad came to a stalemate in 1942. Despite being almost surrounded by German troops, they could not launch a decisive assault. Moscow, the other strategic city of the north, remained in Soviet hands. Both the *Heeresgruppe Nord* and *Mitte* had fought to a standstill, and a deceptive quiet prevailed over the battlefront before the inevitable storm. But no-one knew where or when that storm would arrive.

In this dangerous situation Hitler pronounced himself as supreme commander of the army.

In mid-1942, he decided to continue the offensive by sending his forces to the southeast. When the winter had ended and the muddy roads had dried, German forces pushed onward using *Blitzkrieg* (lightning attack) tactics to penetrate further into the Kalmyk Steppes. By November 1942, German formations had occupied large areas of the Caucasus and reached the city of Stalingrad. This success provided a distraction from the unsatisfactory situation in the north.

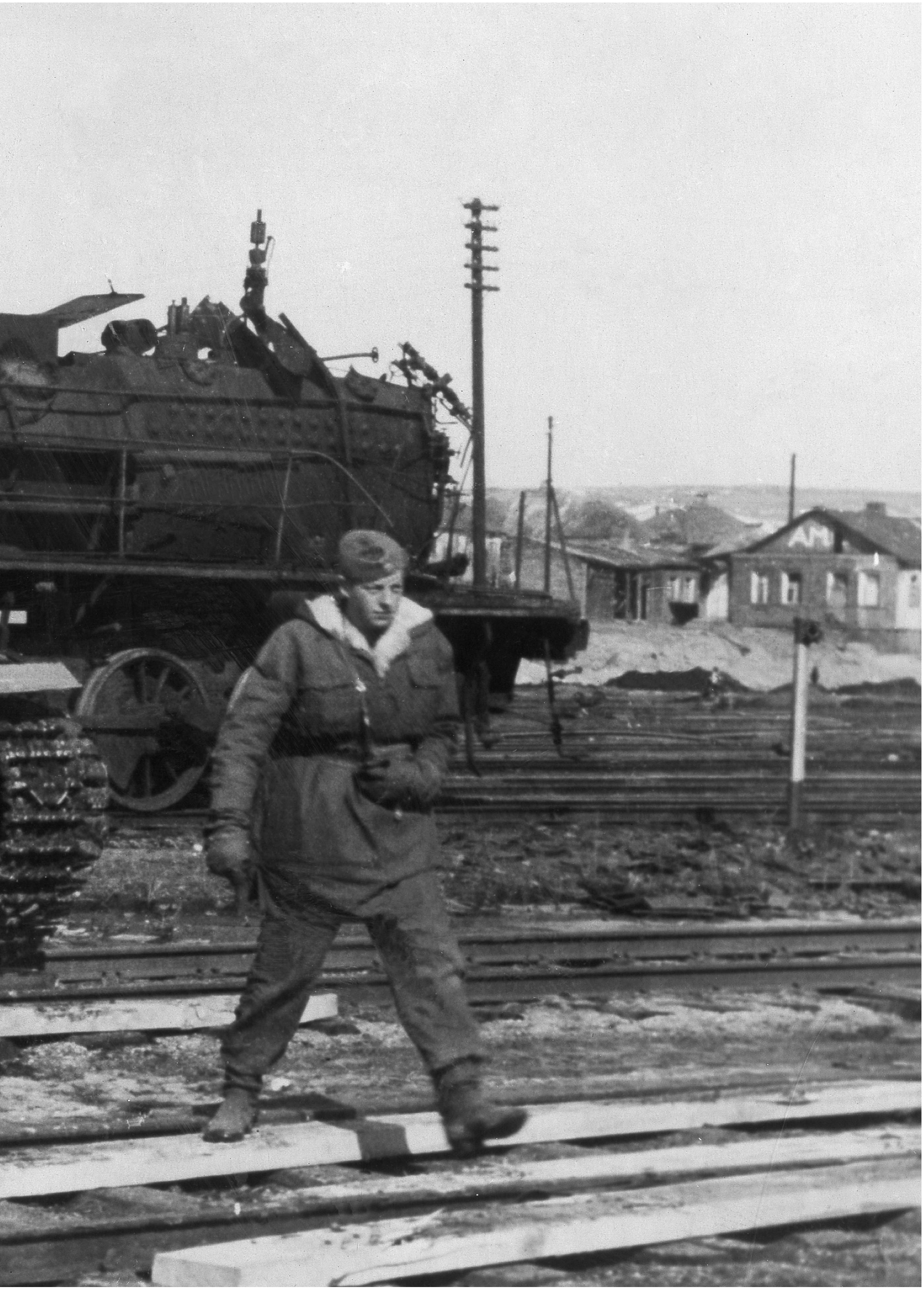


Elements of StuGAbt 210 begin advancing towards the Caucasus during *Fall Blau*. All the *Sturmgeschütz* are Ausf Fs without appliqué armour, but retrofitted with long barrelled StuK 40. A Kfz 4 *Truppenluftschutzwagen*, for anti-aircraft defence, fitted with a twin *Maschinengewehr* (MG) 34 is passing the column. (StuArt archive)

Stalingrad on the river Volga was of immense importance to both Hitler and Stalin. The oilfields and large stocks of raw materials were regarded as essential to ensure a continuous supply to the Reich. However, Hitler made a false assumption; he had convinced himself that Soviet forces in the area had been decisively weakened.

When Hitler decided to launch the attack, he planned to use Italian and Romanian forces to defend the flanks of the main assault by German forces. In August 1942, they crossed the river Don and prepared for the final assault on Stalingrad. German forces surrounded the city, and occupied large parts, but the river Volga provided a natural barrier to the complete encirclement of Stalingrad.

By this time, German supply lines had become dangerously overstretched, which made it almost impossible to send in reinforcements or keep the weakened troops supplied with equipment, ammunition and food. StuGAbt 177, 243, 244 and 245 (StuGAbt 203 was rushed from the Caucasus to help) fought in Stalingrad against Soviet defenders who put up an unexpectedly resolute resistance. Another year of war would end in agony for Germany.



A *Sturmgeschütz* Ausf G from the December 1942 production batch crossing the tracks in a railway marshalling yard in the city of Belgorod, Ukraine. Engineers have laid timber balks to prevent damage to the vehicle's tracks. (Getty)

Stalingrad and Beyond

6

In spring 1943, the situation became critical on two important fronts; *Panzerarmee Afrika* (Tank Army Africa) in Tunisia and 6.Army at Stalingrad. Both were faced with surrender or annihilation.

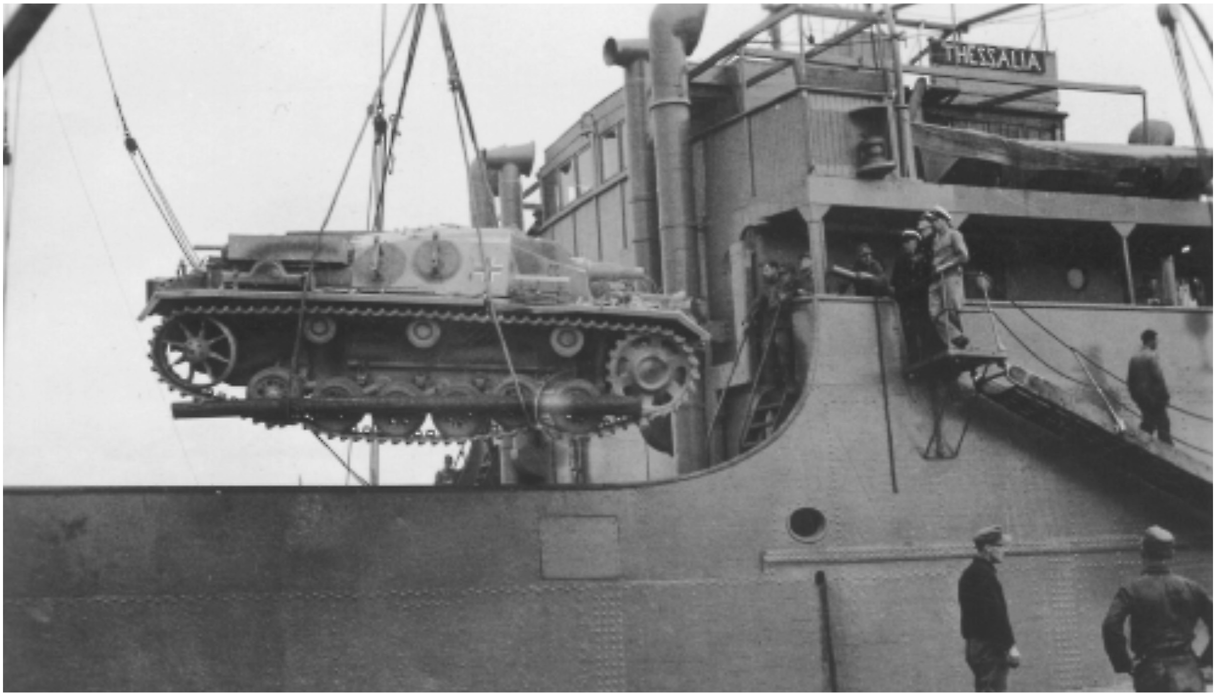
During the campaign in North Africa, which started so promisingly in 1941, *Sturmgeschütz* were not used in significant numbers. There appears to be no plausible reason for this, except the lack of 'breakthrough' targets to be attacked.

Even before he had launched Operation *Barbarossa*, Hitler had prepared plans for an advance even further to the east. After defeating Soviet Russia, it was planned that a special force would advance through Iran and then attack India, part of the British Empire. To achieve this, *Sonderverband* (special unit) 288 was established in summer 1941. This unit was an unorthodox amalgamation of different sub-units, and was covered by no official organizational structure, but did have a detachment of three *Sturmgeschütz*.

Since the war against Russia did not proceed according to plan, the advance by *Sonderverband* 288 had to be postponed. In March 1942, after a short time in Greece, the unit was transported to Benghazi and was involved in all the major battles in North Africa. A sole *Sturmgeschütz* was reported as being operational in August 1942. In September, *Sonderverband* 288 was withdrawn from the front for rest and re-equipment. The unit was renamed *Panzer-Grenadier-Regiment* (PzGrRgt) *Afrika*, and deployed to cover the retreat of *Panzerarmee Afrika* to Tunisia.

In May 1943, a further *Sturmgeschütz* unit was chosen for combat in North Africa. On 15 November 1942, some six months earlier StuGAbt 242 had been established for 'deployment in the tropical east'. But this order was cancelled on 31 December, and the unit was re-equipped for combat in Russia. However, despite all their vehicles being painted in 'tropical' camouflage they were sent to the Stalingrad front in the winter. The unit was almost wiped out, but by

A *Sturmgeschütz* of StuGAbt 226 on the northern front near Leningrad, in the winter of 1942/43. The troops are loading ammunition into the vehicle; each wooden case contained three 7.5mm PzGrPatr 39. The vehicle has been camouflaged with a coating of whitewash paint and fitted with a locally made baggage rack (Getty)



A *Sturmgeschütz* Ausf D of *Sonderverband* 288 (a unit formed of German and Arab personnel) being unloaded from the cargo ship *Thessalia*. On the right-hand side of the superstructure, a fitting has been added to carry extra road wheels. Note, the German cross is non-standard being in what appears to be reversed colours. (Anderson)

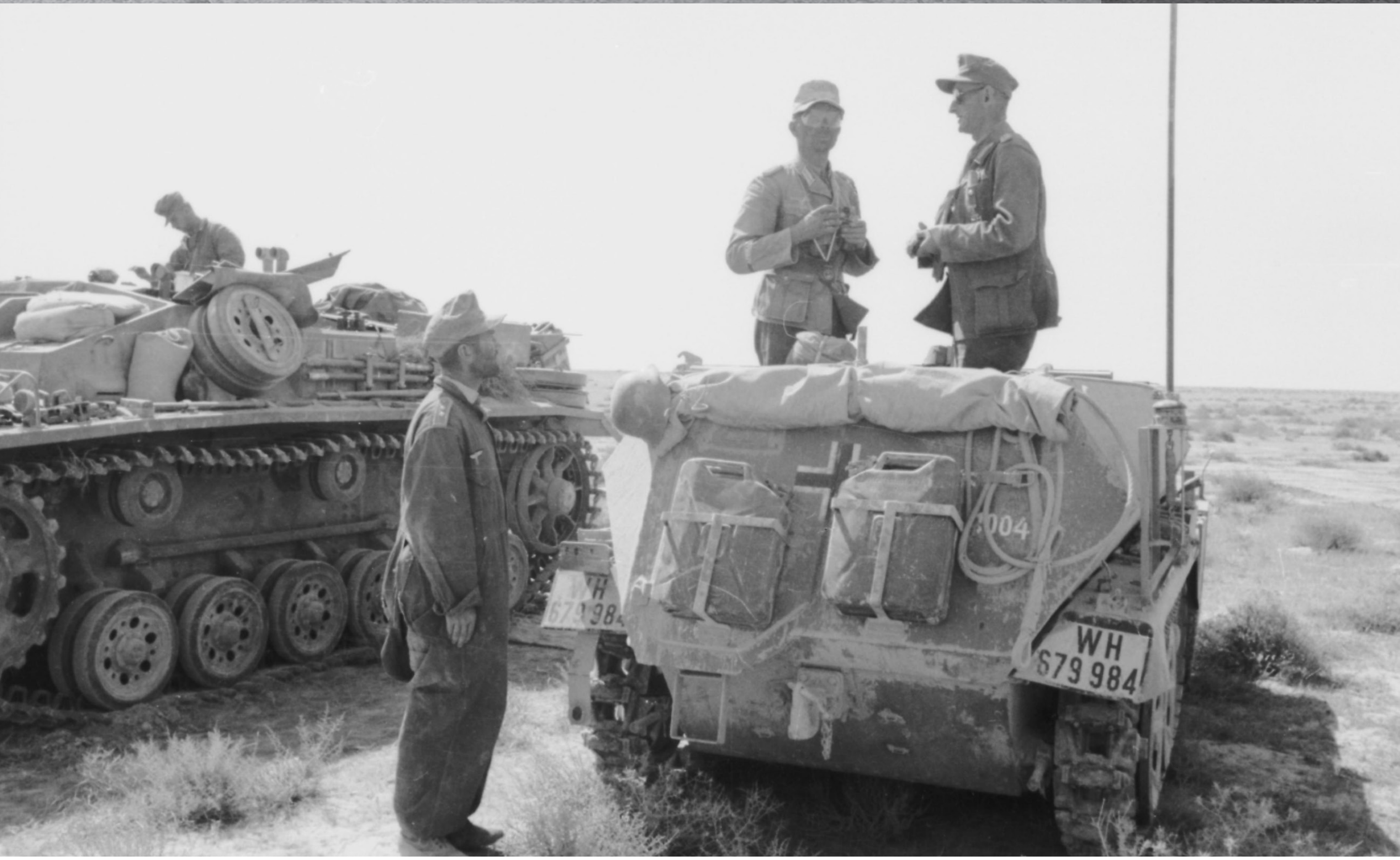
May 1943 what remained of StuGAbt 242 was re-equipped, and again their vehicles were painted in 'tropical' camouflage. At the same time, 1.*Batterie* was withdrawn and renamed StuGBttr 90, then sent to Tunisia equipped with ten *Sturmgeschütz* Ausf F/8s. As part of 10.PzDiv, it fought until German and Italian forces ceased fighting on 12 May 1943.

Organizational Changes 1942–43

During 1942, organizational structure KStN 446, dated 1 November 1941, stated that each battery was to have ten *Sturmgeschütz*, giving a total of 31 in each *Abteilung*. New units and those battle-weary units sent back to the Reich for rest and replenishment were equipped to KStN 446. It is quite possible that by the beginning of 1943 all *Abteilungen* were so equipped. An exception to KStN 446 were the few independent batteries.

During 1942, the heavy fighting on all fronts led to losses of men and equipment: the situation became desperate when sufficient reinforcements and supplies could not reach forward positions. The rapid increase in the number of military units demanded standardization, and in the following months the Schell Plan became fully effective, which significantly reduced the number of soft-skinned vehicle types then in production. Quite naturally, this problem also had an effect on the organizational structure of the *Sturmartillerie*.

KStN 446 was adapted for the new situation, and KStN 446a, dated 1 November 1942, was published. Alongside some minor changes, the SdKfz 250/6 light armoured ammunition carriers were withdrawn and replaced by two 3-ton trucks for each platoon.



A *Sturmgeschütz* Ausf D of *Sonderverband* 288. Note that a spare torsion bar is carried above above the running wheels. It is not known if the *Sturmgeschütz* detachment of SV 288 acquired a *Führerwagen* in North Africa – possibly this SdKfz 253 is from a different unit and was used as an artillery observer's vehicle. (Anderson)

The very difficult terrain and weather conditions in most regions of the Eastern Front, particularly the mud season and severe winter, caused serious problems for all vehicles, including the *Sturmgeschütz*. During 1943, all *Sturmgeschütz-Abteilungen* were supplied with *Maultier* (Mule) vehicles: a standard 3-ton truck fitted with a Carden-Loyd-type tracked bogie in place of the rear-drive axle. Although able to cope with deep mud or snow, these vehicles were a temporary solution; a poor substitute for the powerful light and medium halftrack vehicles such as the SdKfz 10 or SdKfz 11.

When they became available in February/March 1943, *Sturmhaubitzen* (assault howitzers) were issued to the batteries at a ratio of three to seven standard StuK 40 armed *Sturmgeschütz*. KStN 446a was not changed.

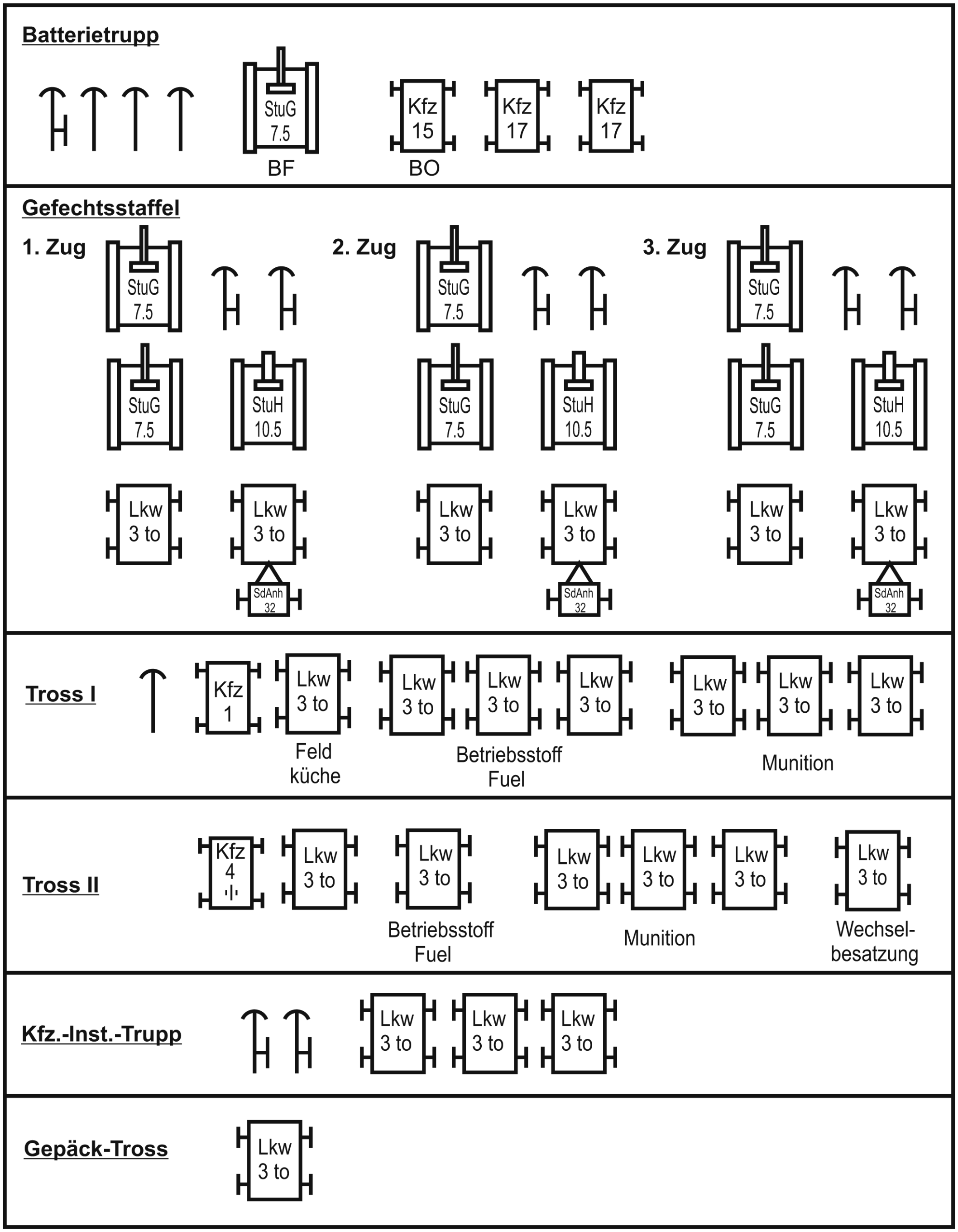
Schwere Sturmgeschütz-Abteilungen

During 1942, German industry was contracted to develop and produce more powerful tanks and also *Selbstfahrlafette* guns, a direct consequence of the encounters against the Russian T-34 medium and KV-1 and KV-2 heavy tanks.

Around this time Hitler began to intervene more frequently in matters better left to the discretion of engineers and skilled military planners. The Panther and Tiger programme was initiated, which resulted in designs for a medium and heavy tank to achieve absolute battlefield superiority. The PzKpfw

Sturmgeschützbatterie

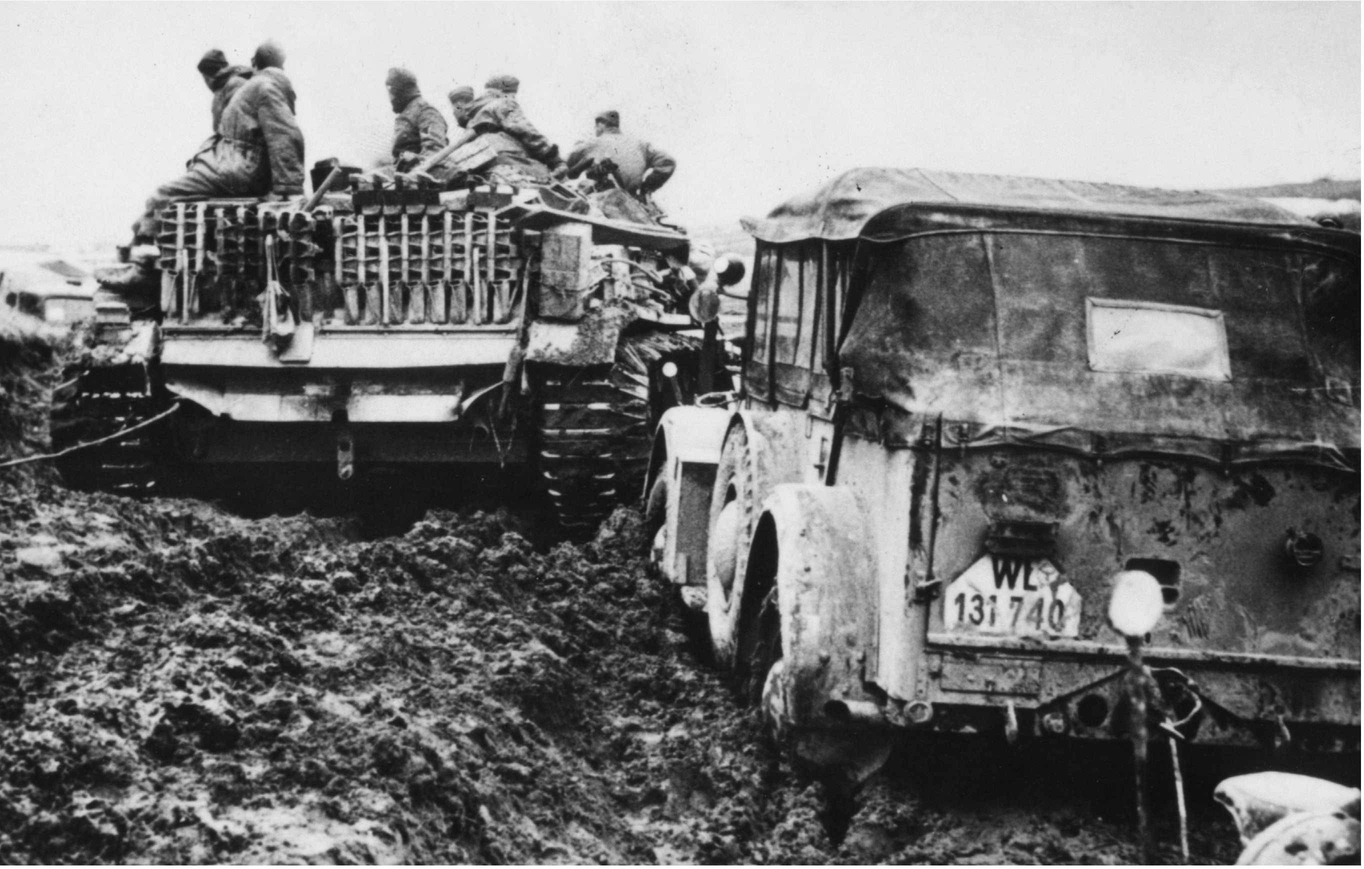
Table of organization, (Ten StuGs) according to KStN 446a, dated 1 November 1942.
Actual unit strength as of mid-1943, issued with *Sturmhaubitzen*.


Batterietrupp
StuG 7.5
BF
Kfz 15
BO
Kfz 17
Kfz 17
Gefechtsstaffel
1. Zug
StuG 7.5
StuG 7.5
StuH 10.5
Lkw 3 to
Lkw 3 to
SdAnh 32
2. Zug
StuG 7.5
StuG 7.5
StuH 10.5
Lkw 3 to
Lkw 3 to
SdAnh 32
3. Zug
StuG 7.5
StuG 7.5
StuH 10.5
Lkw 3 to
Lkw 3 to
SdAnh 32
Tross I
Kfz 1
Lkw 3 to
Feld küche
Lkw 3 to
Lkw 3 to
Lkw 3 to
Betriebsstoff Fuel
Lkw 3 to
Lkw 3 to
Lkw 3 to
Munition
Tross II
Kfz 4
Lkw 3 to
Lkw 3 to
Betriebsstoff Fuel
Lkw 3 to
Lkw 3 to
Lkw 3 to
Munition
Lkw 3 to
Wechsel-besatzung
Kfz.-Inst.-Trupp
Lkw 3 to
Lkw 3 to
Lkw 3 to
Gepäck-Tross
Lkw 3 to

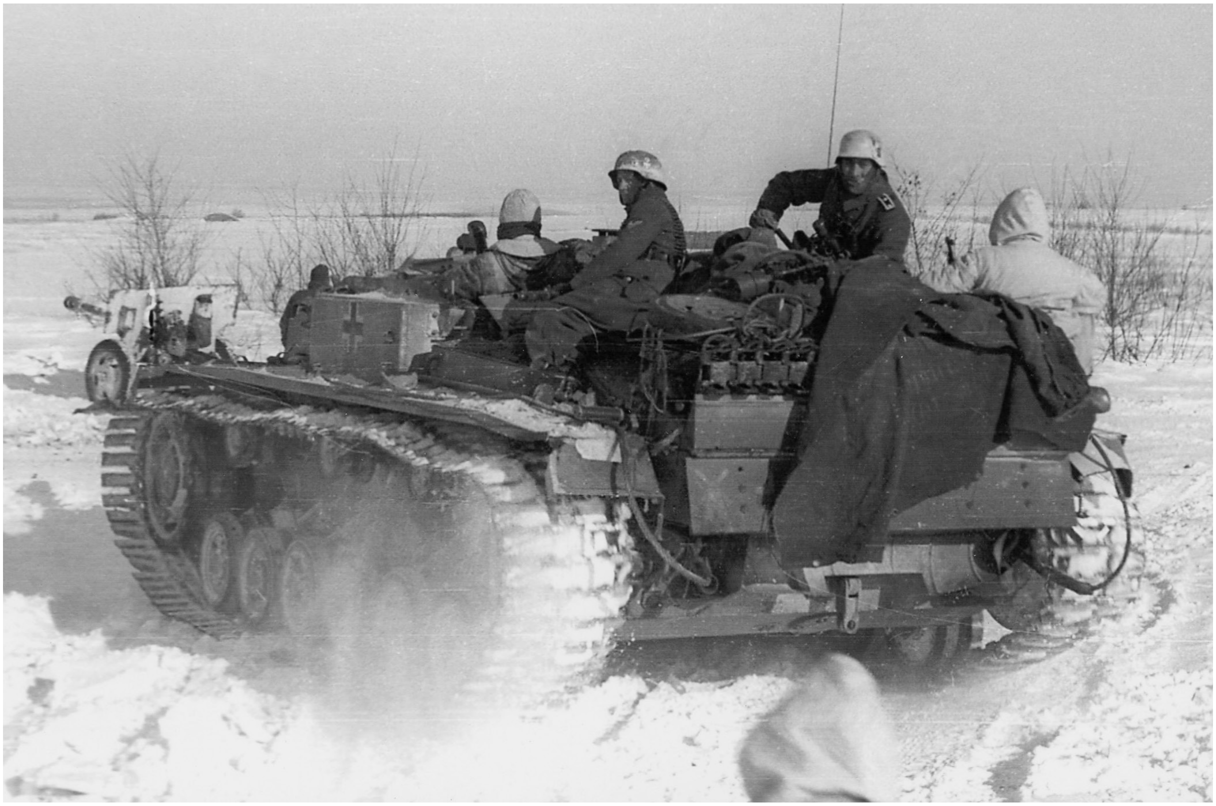
V Panther would become a well-balanced, powerfully-armed tank: however, the suffix '*schwer*' (heavy) quickly received a different meaning other than a weight category. Hitler's definition of 'superiority' amounted to nothing more than demanding powerfully armed and heavily armoured tanks and SP guns, if necessary at the expense of mobility. Indeed, Hitler wanted break-through tanks, to satisfy his grand desire to smash the enemy: His mania for gigantic war machines was born.

In early 1943, the first of the type was delivered. The vehicle was based on the chassis of the ill-fated Porsche-designed VK 45.01(P) originally designed to enter production as a heavy tank. When the decision was taken to order the Henschel type, Porsche had already ordered the production of 100 hulls. To avoid scrapping them, they were heavily modified at considerable expense to be used for an assault gun. The type mounted the deadly 8.8cm PaK 43 in a fixed superstructure fabricated from armour plate up to 200mm thick, and was subsequently designated as a *schwere Sturmgeschütz*.

The new vehicle was to be integrated into the *Sturmartillerie*, which graciously accepted the prospect of receiving 'superior material.' In order to include the weapon, the general organization structure would have to be adapted. All previous *Sturmgeschütz-Abteilungen* established were re-designated



In most regions of Russia, the *Raputitsa* (quagmire season) of spring and autumn turned the ground into a muddy morass which greatly affected the mobility of German forces. Both tanks and *Sturmgeschütz* equipped with *Winterketten* were the only vehicles able to move and were often called on to tow supply trucks and other vehicles out of the mire. (NARA)



Above: A *Sturmgeschütz* Ausf F/8 of StuGAbt 901 in the deep snow of a Russian winter. When the ground became frozen, mobility (even when fitted with *Winterketten*) became severely limited. In the background is a captured Russian 76.2mm anti-tank gun; large numbers of these powerful weapons were re-used by German infantry units. (StuArt archive)

Right: During the winter of 1941/42 German soldiers had been poorly clothed for winter, but a year later they had been supplied with long padded coats as protection against the very low temperatures of a Russian winter. (Anderson) as *leichte* (light) *Sturmgeschütz-Abteilung* (StuGAbt). Subsequently, the new *schwere Sturmgeschütz* (s StuG) was to be issued to *schwere* StuGAbt. On 15 January 1943, orders were given to establish five new *Sturmartillerie* units:

> According to special Order No.3, the following units are to be established by the artillery school:
>
> a) le StuGAbt 911 ready for combat 15 March 1943
> b) s StuGAbt 197 ready for combat 15 March 1943
> c) le StuGAbt 912 ready for combat 1 April 1943
> d) s StuGAbt ready for combat 30 April 1943, no later.
> e) s StuGAbt ready for combat 31 May 1943, no later.
>
> 5) Formation of the unit shall take place in such a way that each battery [of the s StuGAbt] can be ready for combat when the first new production PzKpfw VI Tiger arrives, (possible in February 1943).

Although it was intended for the *schwere Sturmgeschütz* to use *Sturmartillerie*-type tactics, matters would turn out differently. In March 1943, Guderian intervened and ordered that the *schwere Sturmgeschütz* was to be placed under the responsibility of the *Panzertruppe*. The *schwere Sturmgeschütz* was now renamed to *Panzerjäger* Tiger (P), and was known as 'Ferdinand' in honour of the designer Ferdinand Porsche, a close friend of Hitler. The s StuGAbt 197 was renamed and renumbered as *schwere Panzerjäger-Abteilung* 653 (s PzJgAbt 653). For the moment, all plans to change the equipment and organization of the *Sturmartillerie* were cancelled.

However, with the *Sturmgeschütz* production increasing, the number of *Sturmartillerie* units being formed increased:

Establishment of *Sturmgeschütz* units in 1942:

StuGAbt 249	established January 1942	combat in the east
StuGAbt 600	established March 1942	combat in the east
StuGAbt 667	established June 1942	combat in the east
StuGAbt 287	established August 1942	combat in the east
StuGAbt 228	established November 1942	combat in the east
StuGAbt 232	established November 1942	combat in the east
StuGAbt 242	established November 1942	combat in the east, later Italy
StuGAbt 270	established December 1942	combat in the east
StuGAbt 904	established December 1942	combat in the east
StuGAbt 905	established December 1942	combat in the east

A few *Sturmgeschütz* units were established as independent batteries: StuGBttr 393, established November 1942, was deployed in the east as an integral part of *Sturmbrigade* 1 (StuBrig 1). In August 1943, the battery was incorporated into StuGAbt 201.

StuGBttr 395, established in November 1942, was an integral part of StuBrig 2. By early 1943, the battery had been integrated with StuGAbt 244.

Sturmgeschützlage **(*Sturmgeschütz* availability)**

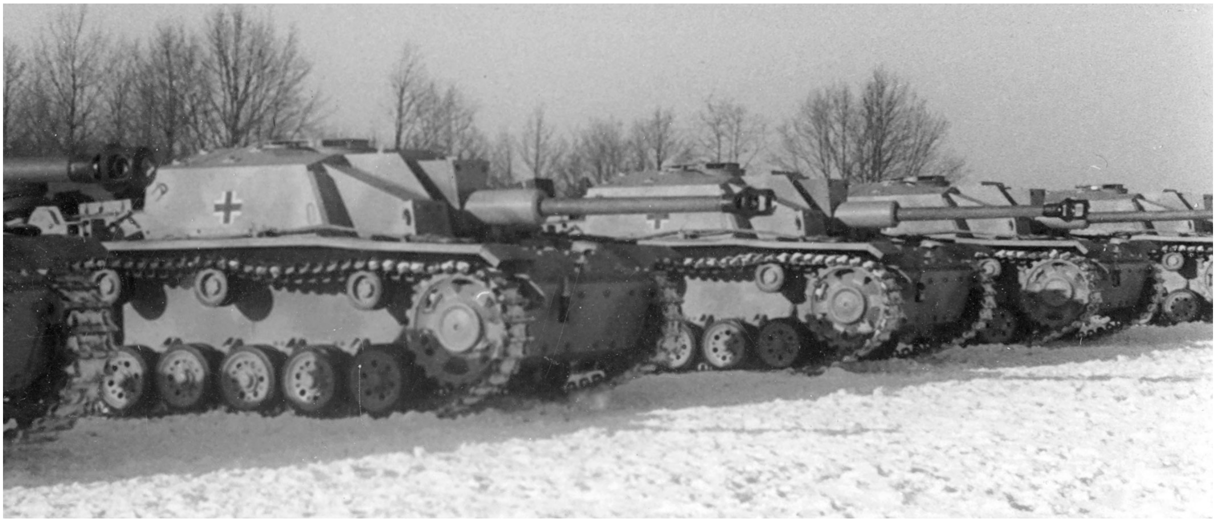
Date	Number of StuGAbt	StuG ready for action	StuG in the workshop	StuG total	Average strength per *Abteilung*
June 1942	18	166	44	206	11
July1942	19	258	42	300	15
August 1942	19	277	75	352	18
September 1942	20	294	115	409	20
October 1942	19	295	120	415	21
November 1942	20	347	101	448	22
December 1942	27	315	127	442	16

During the final fighting at Stalingrad, a number of StuG units were destroyed, but all were to be re-established.

StuGAbt 177, re-established by March 1943, then combat in the east
StuGAbt 243, re-established by March 1943, then combat in the east
StuGAbt 244, re-established by March 1943, then combat in the east
StuGAbt 245, re-established by March 1943, then combat the in east

StuGAbt 242 suffered heavy casualties at Stalingrad. After the unit was withdrawn, it returned to Germany and was re-established at Jüterbog in March 1943. The unit was then transported to Italy.

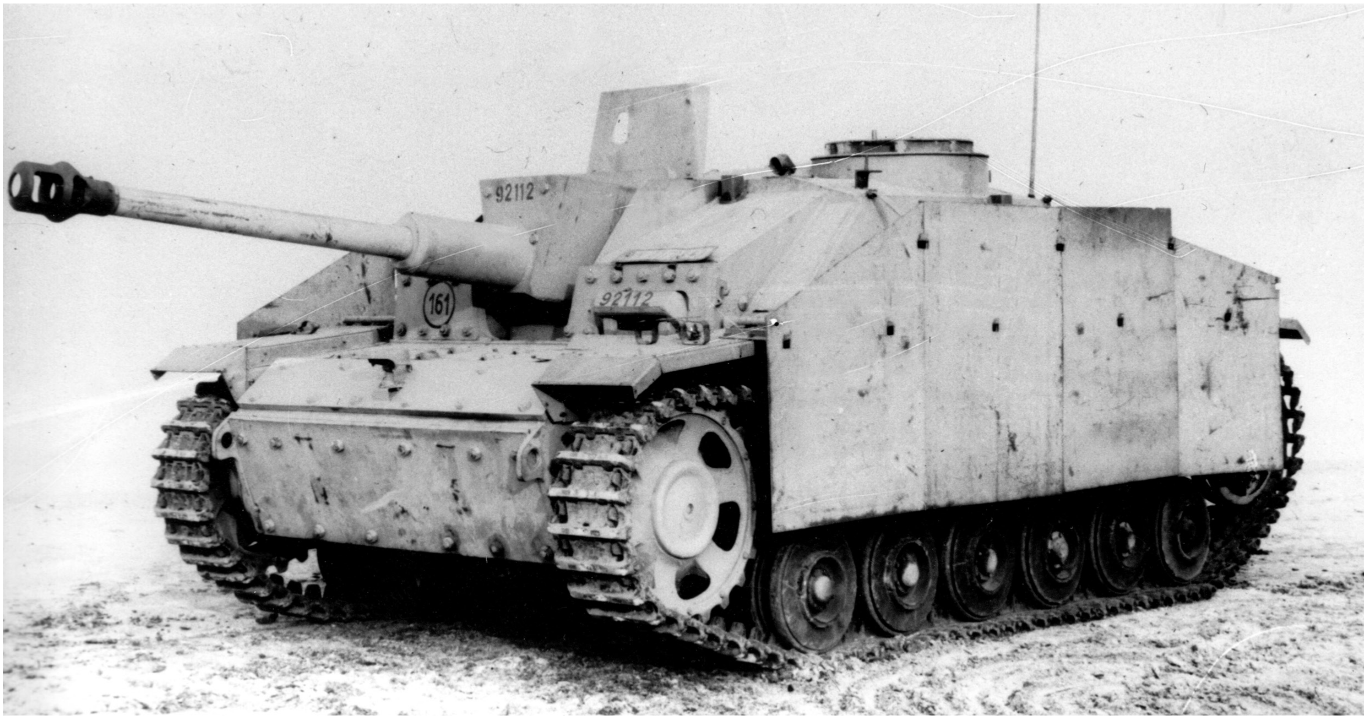
Up until early 1943, the precise information as to the status of different units was not published as accumulated statistics. This was to change with the creation of *Generalinspekteur der Panzertruppen*, (chief inspector of tank troops), a post which was occupied by Guderian until end of the war. From April 1943, accurate information was collected and published. The following tables show the '*Sturmgeschützlage*' (StuG availability) for *Sturmartillerie* units at given dates.



In December 1942, the improved *Sturmgeschütz* Ausf G entered production and one of the first units supplied with the type was StuGAbt 226. The superstructure on the vehicle was significantly widened and fitted with a rotating commander's cupola, fitted with seven vision devices. All the vehicles have been delivered in tropical camouflage, but crews will soon apply a coating of white-wash paint. It is not known why the muzzle brakes on the guns have been painted black. (Schneider)

***Sturmgeschützlage* 14 April 1943**

Heeresgruppe	StuG Abt	StuG Bttr	Unit status	StuG status	*kurz*	*lang*	StuH
Nord	912		Unit in delivery	Combat ready		22	9
				In workshop			
	184			Combat ready	8	9	
				In workshop	3	6	
	226			Combat ready		13	
				In workshop		15	
Mitte	177		Unit in delivery	Combat ready		22	
				In workshop			
	202			Combat ready	7	10	
				In workshop	2	3	
	904			Combat ready		13	
				In workshop		6	
	189			Combat ready		20	
				In workshop		2	
	270			Combat ready	6	17	
				In workshop	3		
	667			Combat ready	4	11	
				In workshop	2	4	
	185			Combat ready		11	5
				In workshop		1	
Süd	203			Combat ready		4	
				In workshop		23	
	210			Combat ready		14	
				In workshop		3	
	243			Combat ready		27	
				In workshop		4	
		287		Combat ready		3	
				In workshop			
	209			Combat ready		7	
				In workshop		2	
	232			Combat ready		6	
				In workshop		3	
		Lehr 901		Combat ready		6	
				In workshop			
	911			Combat ready		22	
				In workshop			
	228			Combat ready		9	
				In workshop		8	
	GD			Combat ready		19	
				In workshop		13	
A		249		Combat ready	7	10	
		In workshop			1		
	191			Combat ready		8	
				In workshop			
West	905			Combat ready		20	
				In workshop		2	
Afrika	1/242			Combat ready		4	
				In workshop			
				Total	**43**	**402**	**14**



After the first production *Sturmgeschütz* Ausf G had been delivered, a series of modifications were initiated. The angle of the sloping front armour on the pannier boxes was increased to eliminate a potential bullet trap, and the roof-mounted ventilator was relocated to the rear of the superstructure. This Ausf G, chassis No. 92112, is uniquely fitted with resilient-type road wheels, which were tested but never used on production vehicles. (Historyfacts)

The Replacement System

Military units in combat require an organized structural system to ensure the allocation of supply and replacement of both materiel and personal. In the German army, the supply of materiel was the responsibility of the *Heereszeugämter* (HZa – army arsenals). They were to arrange delivery from the manufacturers of everything (clothing, food, ammunition and even tanks) to a number of locations in the many *Wehrkreise* (military districts). New *Sturmgeschütz* for the *Sturmartillerie* were delivered from the manufacturer and then fitted with secondary equipment such as radios and optical equipment. The HZa was then responsible for the transport of the vehicles to units in the process of being formed, or to a combat unit on the battlefront.

On another level, the different branches of the German military relied on a system of basic and specialist training for recruits and for training replacement units, the *Ersatz-Abteilungen*. In principle every German unit, from an independent company to a division, was formed using this system.

When the *Sturmartillerie* was formed, the first independent batteries were assigned to the ALR Jüterbog in *Wehrkreis* III, Berlin. After the first *Sturmgeschütz-Abteilungen* were established, a new, more efficient system was required. In March 1941, soon after StuGAbt 204 had been established, it was disbanded and renamed as *Sturmgeschütz Ersatz Abteilung* (StuGErsAbt) 200 and relocated to Schweinfurt. As the *Sturmartillerie* became more important, a number of replacement units were established:

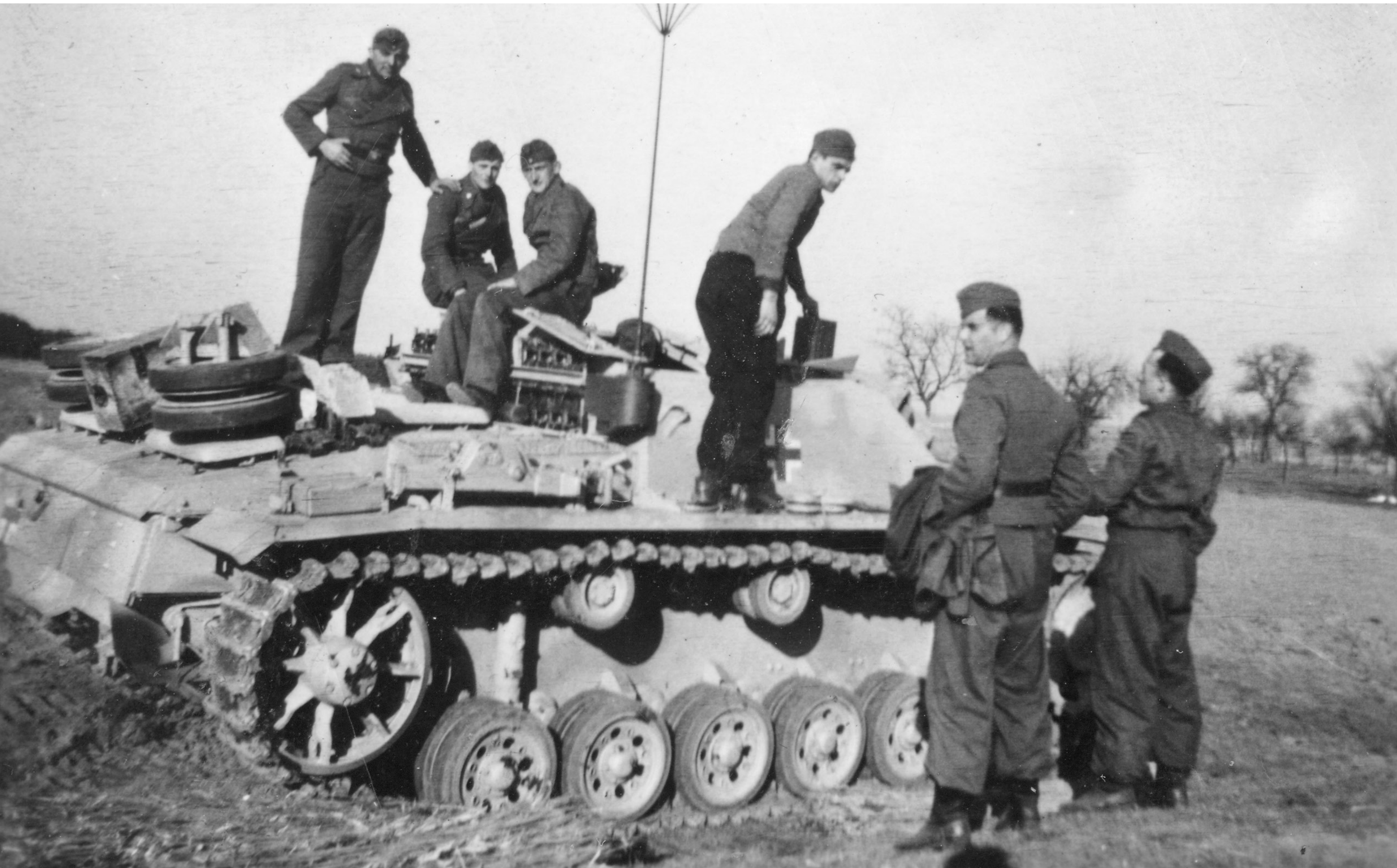
December 1941 – StuGErsAbt 300 in Neisse (now Nysa), Silesia
December 1942 – StuGErsAbt 400 in Jüterbog
July 1943 – StuGErsAbt 500 in Burg
July 1943 – StuGErsAbt 600 in Schweinfurt
July 1943 – StuGErsAbt 700 in Neisse

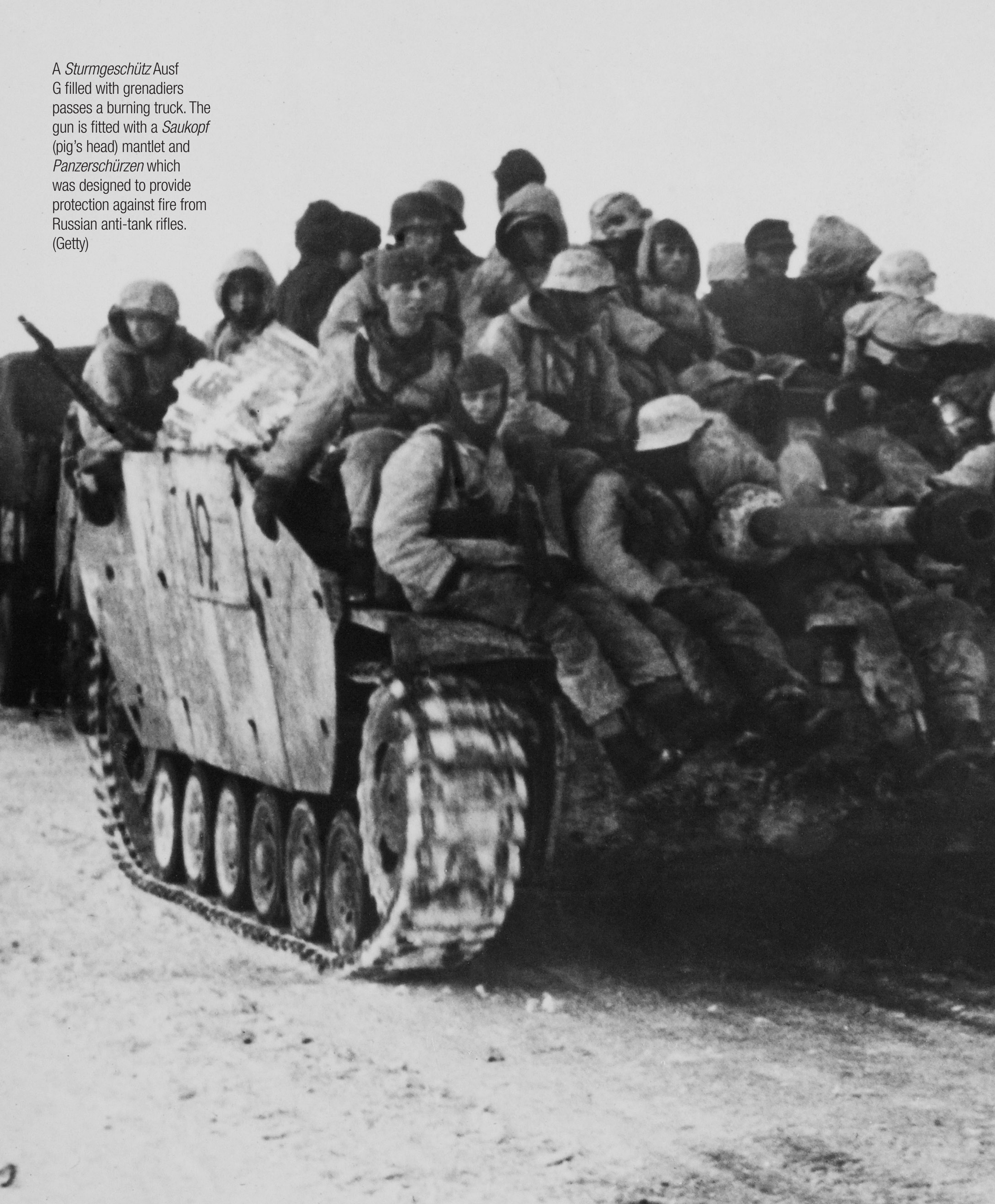
The fact that three replacement units were formed in July 1943 reflects the increasing importance being placed on the *Sturmartillerie* by the OKH. At the same time the *Sturmartillerie* replacement units were also responsible for training the numerous *Panzerjäger Kompanien* (tank hunter companies) of the *Heer* (army) and *Luftwaffe*, and the *Panzer-Sturmgeschütz Abteilungen Panzertruppe* which, from 1943, was also equipped with assault guns. Later in 1943, the StuGErsAbt were renamed as the *Sturmartillerie Ersatz und Ausbildungs-Abteilungen* (StuGErsuAusbAbt – replacement and training battalion), thus putting more emphasis on their training duties.

The units had identical structures: a staff battery, one leading battery and three training batteries. The supply of training vehicles for StuGErsuAusbAbt was always problematic, due to manufacturing difficulties in general, and were forced to use outdated equipment, which included refurbished *Sturmgeschütz*.

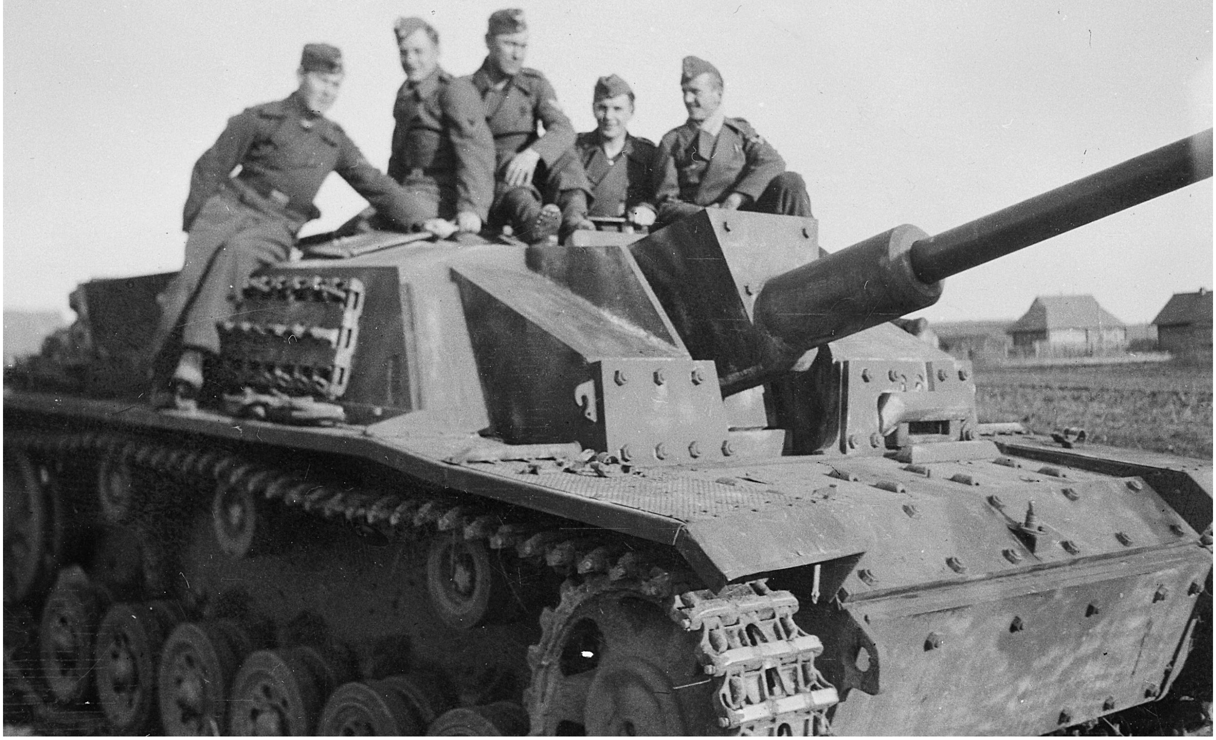
In July 1943, it was decided to move the ALR at Jüterbog to a more suitable and larger garrison in the city of Burg, to the west of Berlin. At around the

A *Befehls-Sturmgeschütz* of StuGAbt 177. From mid-1942, the *Batterie* and *Abteilung* commander's assault guns were fitted, in principle, with a FuG 8 long-range radio beside the standard FuG 16 radio. A *Stermantenne* (star antenna) 'd' was required for the FuG 8. This was mounted on a porcelain isolator, protected by a *Panzertopf* (armoured cover), fitted to the right-hand rear of the superstructure. (Anderson)





A *Sturmgeschütz* Ausf G filled with grenadiers passes a burning truck. The gun is fitted with a *Saukopf* (pig's head) mantlet and *Panzerschürzen* which was designed to provide protection against fire from Russian anti-tank rifles. (Getty)



A *Sturmgeschütz* Ausf G from the December production batch. The superstructure has the steeper-sloped front on the pannier boxes, which have extra 30mm armour plate welded over the standard plates. Extra 30mm armour plates are bolted to the front plate of the chassis and to the superstructure. (Anderson)

same time StuGErsuAusbAbt 500 was also established at Burg, and then incorporated with the ALR to form a *Sturmgeschützschule* (training school).

Further development of the *Sturmartillerie* took place at Burg, which had well-equipped workshop facilities not only for maintenance, but also for experimental work. All suggestions for improvements submitted by the troops were collected and critically examined. The school was also responsible for publishing training booklets and also the modifications leaflets, which were sent to front-line units. The school worked in close cooperation with the manufacturers, Alkett and MIAG.

Increase in Production

During 1942, *Sturmgeschütz* production (190 in 1940 and 540 in 1941) had increased only moderately with some 800 produced. In March 1942, the Ausf F, was introduced and production increased allowing significant numbers of *Langrohr*-armed vehicles to be delivered to front-line units.

A GenStbH (general staff of the army) document, dated April 1943, shows this development in part:

> In the second half of 1942, the number of StuG units has increased by 150 per cent, while the total number of vehicles available had increased by 210 per cent. This was a result of progress with the re-organization. In early 1942, all StuGAbt at the front were still authorized to have six or seven StuGs per battery. All newly established units or those refurbished during the autumn/winter were brought up to ten StuGs per battery. Over this period, a total of 510 *Sturmgeschütz* were written off as total losses, while 659 were received as replacements.

The document further points out that the current production rate of 130 units per month (December 1942) would not supply the number of vehicles necessary for the planned establishment of new *Sturmartillerie* units.

Sturmgeschütz in Service with *Luftwaffe*, *Panzerjäger* and *Panzer* Units

While it was not possible to supply the *Sturmgeschütz* to all army infantry units, the Waffen-SS was in a ‘chosen’ position. When the first SS units were established in 1940 and 1941, each was supported by a dedicated *Sturmgeschütz Batterie*. In 1942, when the first Waffen-SS divisions were established, the practiced continued.

In October 1942 – by which time the *Sturmgeschütz* had already achieved a good reputation as an effective tank hunter – it was decided to provide *Luftwaffe-Feldeinheiten* (air force ground troops) with small detachments (initially four *Sturmgeschütz*) for their *Panzerjäger-Kompanien*. In 1944, these detachments were enlarged to ten vehicles. Furthermore, two airborne *Sturmgeschütz* brigades and the Hermann Göring unit each received an *Abteilungen* with 32 *Sturmgeschütz*. At the beginning of April 1943, the Waffen-SS received similar numbers of *Sturmgeschütze* for their *Panzerjäger-Kompanien*.

Although it was never possible to equip the infantry divisions with complete *Sturmgeschütz-Abteilungen*, from 1943 their *Panzerjäger-Abteilungen* did receive a *Sturmgeschütz-Kompanie*.

In 1943, MIAG also began producing the *Sturmgeschütz*, which allowed production to be quadrupled and over 3,000 *Sturmgeschütz* plus 200 *Sturmhaubitzen* were manufactured in that year.

This increase was critical, since production of the PzKpfw III ceased at the beginning of the year, and been replaced by the PzKpfw IV. However, the transition was not without problems, as output of the PzKpfw IV could not be increased. To compensate for this, a decision was made to equip *Panzer* and *Panzergrenadier* divisions with *Sturmgeschütz* in place of tanks. From May 1943, the *Panzertruppen* were to receive 100 *Sturmgeschütz* each month.

An *Organistationsabteilung* status report, dated 15 December 1943, stated:

Subject: StuG-*Abteilungen*

1.) Inventory by 1 October	22 *Abteilungen*
2.) Total losses in Stalingrad	4 *Abteilungen*
3.) Replenished since October 1942	7 *Abteilungen*
4.) New establishments since October 1942	18 *Abteilungen*
5.) New units to be established	7 *Abteilungen*
6.) Planned establishments for 1944	0 *Abteilungen*

This list is in contrast to the list shown earlier, possibly due to a different basic calculation being used.

Technical Challenges

At the end of 1942, a number of mechanical changes and modifications were brought in and this process continued into 1943.

Mobility

The first winter in Russia revealed great problems regarding the tactical mobility of both supply and combat units. The deep mud disabled the supply lines, which partly relied on horse-drawn wagons. The mobility of trucks and half-tracked vehicles was near to a standstill. Even fully tracked vehicles (tanks) had serious problems.

A February 1942 after-action report by PzRgt 33 stated:

> 7) Experiences under winter conditions
> c) Damage to tanks caused by the extreme cold:
> Most damage resulted from the poor supply of good winter lubricating oil for engines and transmissions. During to the severe cold, all engines are difficult to start, resulting in considerable wear to both manual and electric starters. Heating in the open by lighting a fire under the engine bay frequently resulted in burnt electrical cables, drive belts and coolant hoses.
> All optical instruments, which are not treated with cold resistant grease, frost over at minus 15°C.

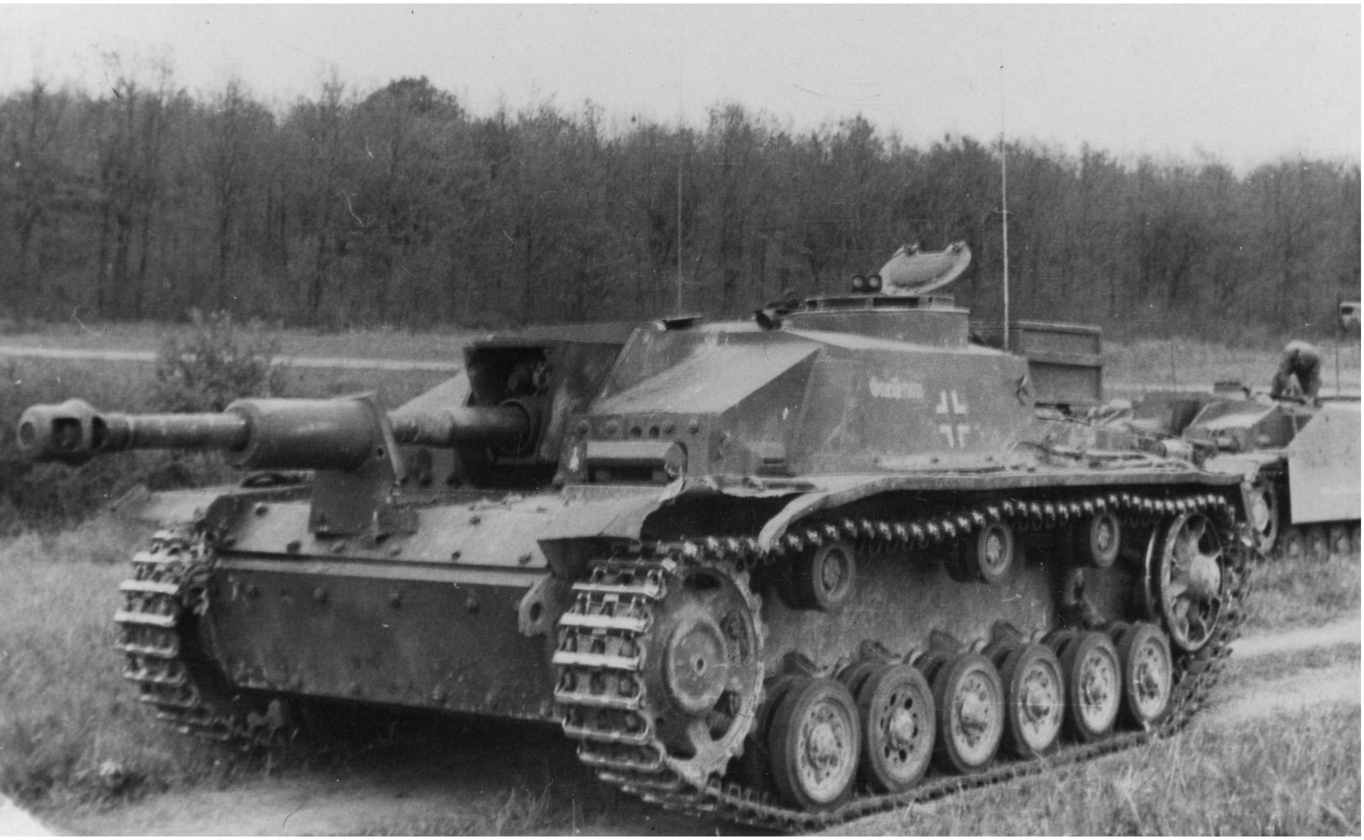
For the second winter in Russia, German troops were better prepared. Albert Speer reported to Hitler on 2 October 1942:

> 2.) I reported to my *Führer* that, independent from the new inter-leaved running gear with wider tracks being developed, the *Sturmgeschütz*, Panzer III and Panzer IV will be provided with *Winterketten* [winter tracks] before the onset of winter. Due to careful pre-planning, some 75 per cent will be equipped by 1 January 1943. The *Führer* has attached great importance that all tanks of *Heeresgruppe Nord* and *Mitte* are to be provided with *Winterketten*.

In the autumn of 1942, the *Winterketten* were made available for fitting on *Sturmgeschütz*, PzKpfw III and PzKpfw IV. The tracks were wider on one side which allowed the ground pressure to be reduced by 30 per cent. Although they did improve mobility over soft or frozen terrain, the wider tracks caused damage to the drive and idler sprockets. The *Organisationsabteilung* made an additional comment on 8 December:

> To improve mobility in winter, widenen tracks (*Winterketten*) were introduced. These tracks protrude over the width of a running wheel and wear out quickly due to being unevenly loaded. By installation of a third (triple-disc) running wheel this shortcoming can be reduced. *Organisationsabteilung* demands the introduction of triple-disc running wheels.

In fact the standard running wheels remained in use without alteration.



A *Sturmgeschütz* Ausf G named '*Gneisenau*' has received a direct hit on the gun mantlet, which has blown off the cover plate. Damage such as this was invariably repaired by workshop teams and the vehicle returned to combat. In the background, there is a *Sturmgeschütz* Ausf F fitted with *Panzerschürzen*. (Anderson)

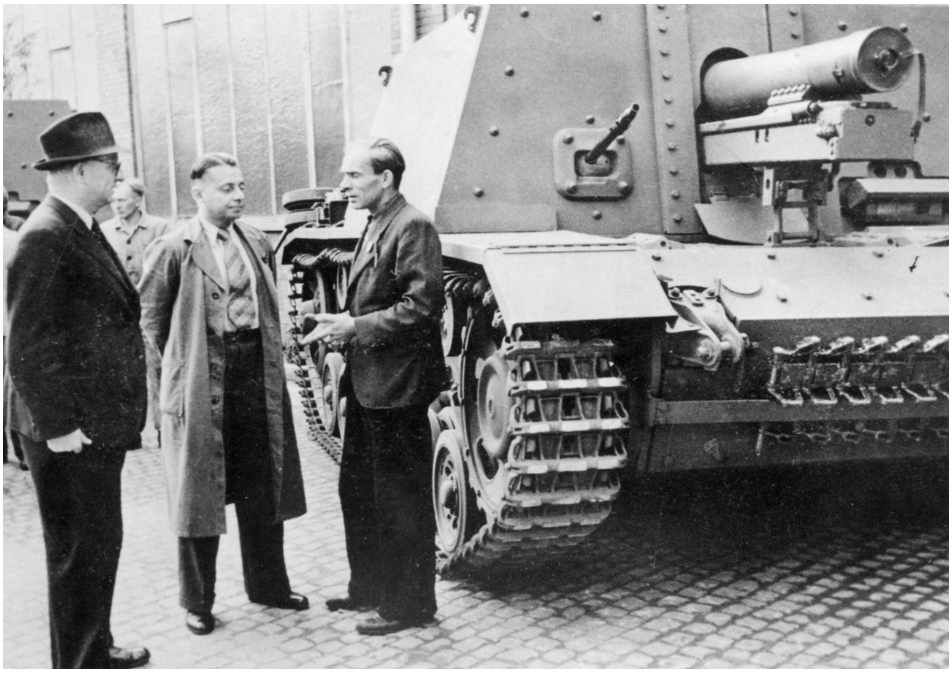
The *Sturmhaubitze*

The *Sturmgeschütz* 7.5cm L/24 had proven its value during the assault on France in 1940 and also in the early stages of Operation *Barbarossa* where, during both attacks, it fulfilled its tactical mission of effectively supporting front-line infantry. The type carried up to 100 rounds of ammunition (and more unofficially stored) which allowed them to sustain effective support missions. However, although the L/24-armed vehicles were only to be used as a combat tank in an emergency or for self defence, these contingencies would change in 1941. While the Russian light tanks encountered at the beginning of the invasion were no match for the 7.5cm *Kurzrohr*-armed vehicles, the unexpected appearance of the Soviet T-34 medium and KV-1 and KV-2 heavy tanks on the battlefield suddenly changed the situation. The 7.5cm *kurz* could be used against Soviet armour, but only by expending a large amount of ammunition: the *Sturmgeschütz* was clearly inferior.

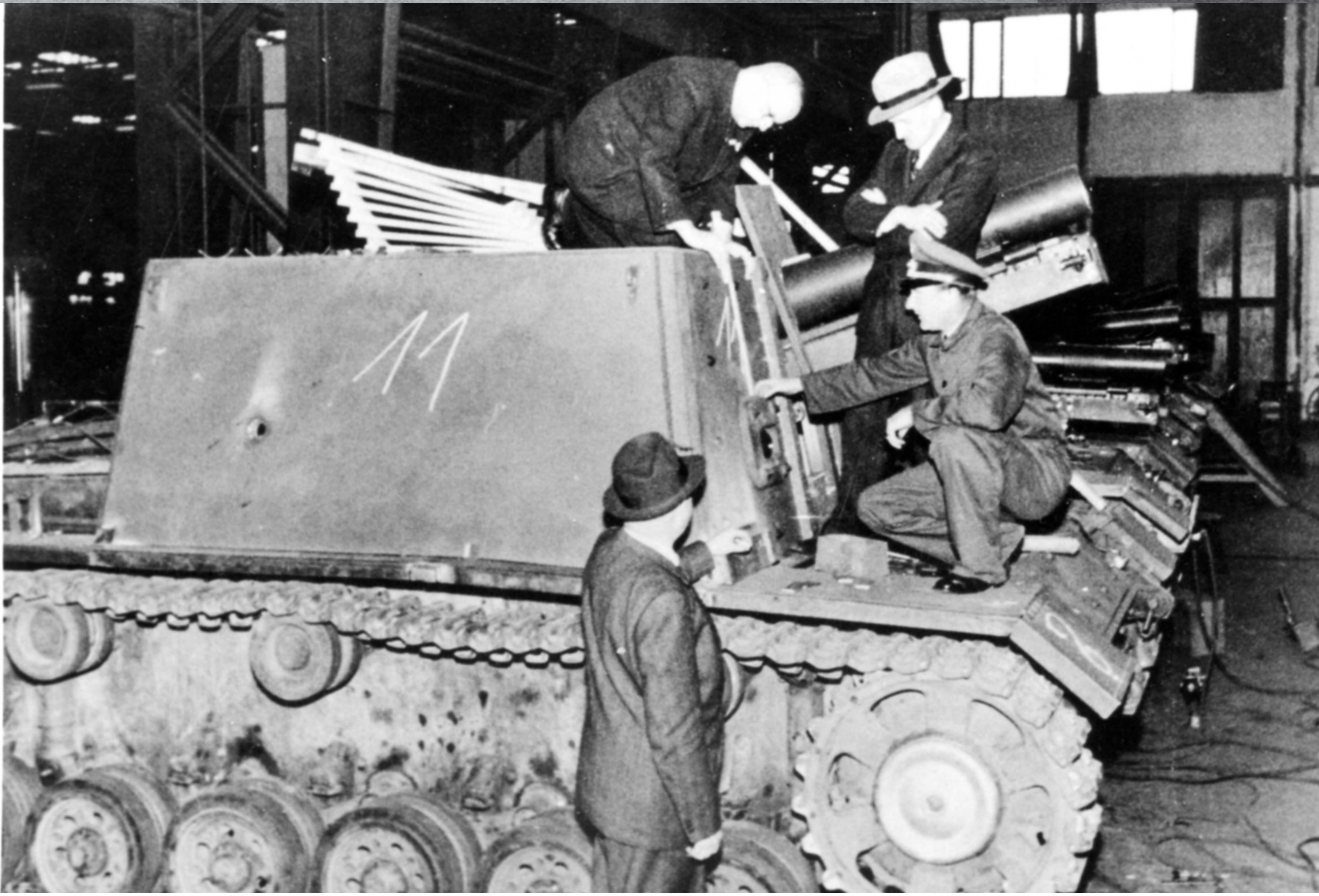
In October 1940, the *General der Artillerie* (using experience gained during the invasion of France) had already established a commission which was tasked to investigate the establishment of the *Friedensheer* (army in times of peace). When dealing with the *Sturmartillerie*, the commission came to the following conclusions:

> V. *Sondergeschütze* [special weapons].
>
> 1.) *Sturmgeschütz* 7.5cm K L/41, muzzle velocity 685mps.
>
> Requirement:
> An increase in armour penetration performance as the *Sturmgeschütz* is to perform as an assault gun, also as a PaK (anti-tank gun) and also as a *leichter Knacker* [light bunker buster]. (This is only valid until the 8.8cm K on PzSfl [armoured SP gun] is available. Order made by the *Führer* on 12 September 1940).
>
> Assessment:
> The fundamental idea of the *Sturmgeschütz* has been proven, as the first combat experiences by the front-line batteries has shown… Regarding the ordnance, it must be pointed out that a longer gun with a higher muzzle velocity would result in a flatter trajectory. Thus firing over the heads of our own infantry makes it impossible to destroy an enemy in trenches or lightly-fortified positions. According to orders of the honorable commander-in-chief of the army, the *Sturmgeschütz* shall assist the infantry when penetrating the enemy zone of resistance in cases where our own artillery cannot. As a result, the vehicle has to be small and agile above all, in order to reach any objective and to be inconspicuous. Heavier vehicles or those with longer guns would be a hindrance.

This interesting comment shows that there were differing views within the inspectorate. Although the commission had broadened the deployment limits for the *Sturmartillerie* by introducing new requirements, the assessment in



The first *schweres Sturminfanteriegeschütz* (sIG) 33 built on the hull of a PzKpfw III, rolls out of the Alkett factory at Berlin-Tegel. The 15cm sIG 33/1 was protected by a large armoured superstructure with front armour 80mm thick. Unlike the *Sturmgeschütz*, the sIG 33 was fitted with a *Maschinengewehr* 34 as a close-defence weapon. (Historyfacts)



The design and development of the sIG 33 was completed in a very short time. An almost completed production vehicle is being examined by *Waffenamt* officials. The 15cm sIG 33 gun is at maximum elevation; note the pistol port in the side of the superstrucure lacks a plug. (Historyfacts)

this report appears to be a criticism. However, the report continues with further opinions:

> Dissenting opinion in WaPrü 1 (ammunition and ballistics) and WaPrüf 4 (artillery): It should be proved whether a gun of higher calibre able to fire at higher angles should be introduced. A 15cm weapon, the *schwere Infanteriegeschütz* (sIG) 33 could be mounted on the chassis of an armoured tracked vehicle.

This is the first indication of the thinking behind installing a considerably more powerful gun in the *Sturmgeschütz*, or on a suitable chassis. The 15cm sIG 33 was the standard heavy infantry gun in service with infantry units, and many attempts to produce a vehicle had been undertaken before the assault on France in 1940. The first attempt mounted a sIG 33 on the hull of the PzKpfw I (Ausf B), but although a number were built, the type was not a success due to a high silhouette and an overloaded chassis, which caused poor mobility.

However, it is quite apparent that parts of the inspectorate still argued for a better armed *Sturmgeschütz*. This was a somewhat farsighted as in September 1940, the introduction of a *Sturmgeschütz* mounting a high-muzzle-velocity long-barrelled gun had not been decided. During 1942, urgent development work was begun to allow the *Sturmgeschütz* to meet all combat requirements.

By mid-1942, the 7.5cm StuK 40-armed *Sturmgeschütz* was in full production. While many after-action reports written at the time, extol the significantly improved power of the StuK 40 against enemy tanks, no indication has been found of any reduction in artillery value. However, since most front-line units still had large numbers of L/24-armed *Sturmgeschütz* available, the troops possibly considered this not to be a severe shortcoming.

However, the original task of the *Sturmartillerie* could only be partially achieved by a StuK 40-armed vehicle. Furthermore, due to the ammunition being significantly longer, ammunition stowage space inside the vehicle was significantly reduced. Another important factor was the limited supply of ammunition for the StuK 40 gun.

To improve the situation, the *General der Sturmartillerie* demanded the development of a heavier-calibre gun, to support 7.5cm StuK 40-armed *Sturmgeschütz* should be accelerated. It was to use only ammunition which was readily available in large quantities on the battlefront.

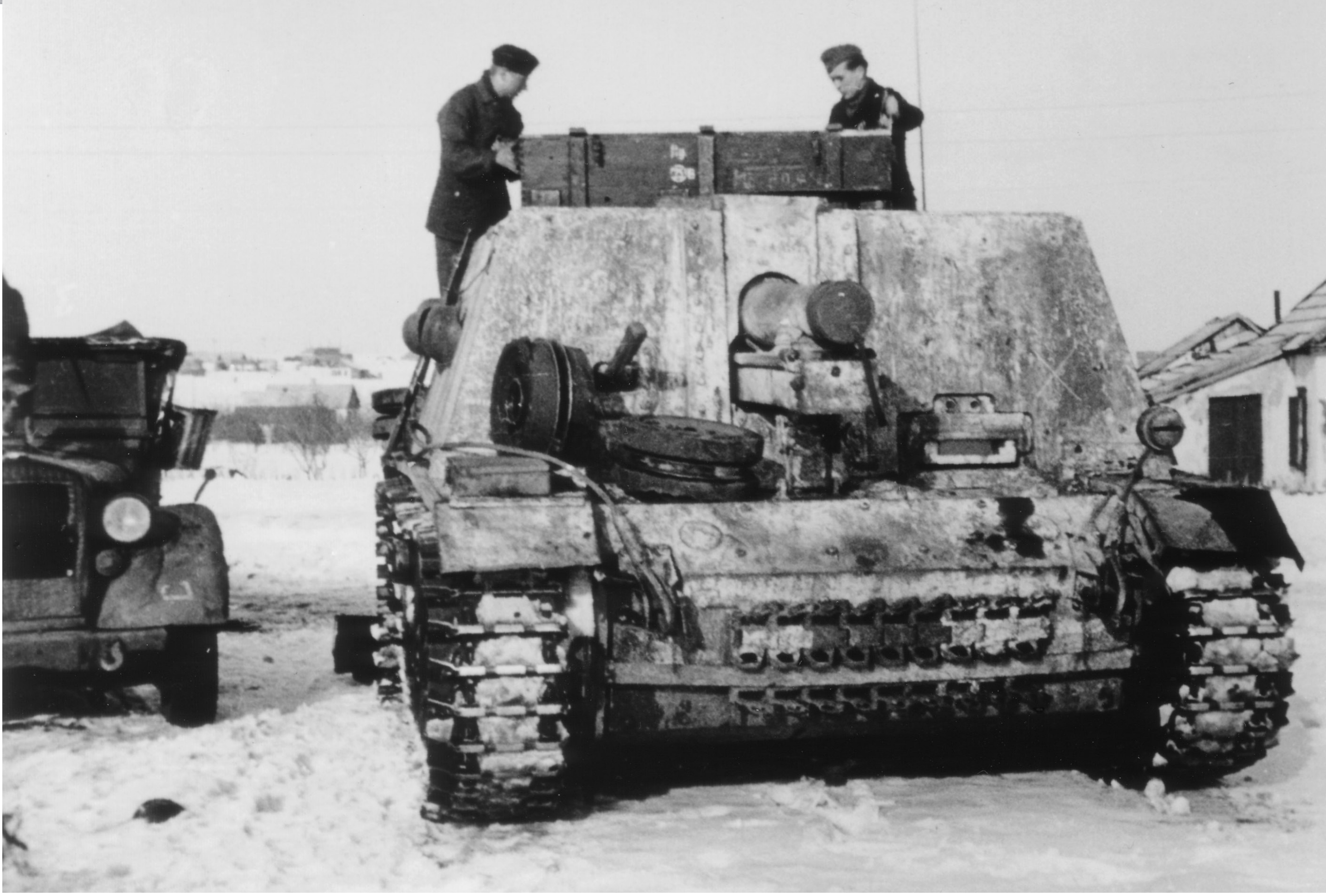
Even before the 7.5cm StuK 40 entered production, the 10.5cm *leichte Feldhaubitze* (l FH – light field howitzer) 18 M, had been selected for installation in the *Sturmgeschütz*. A *Versuchsstück* (test sample) was delivered in March 1942, and 12 were ordered for a series of trials. Due to numerous production problems, the first nine were delivered in October 1942 and the final three in January 1943. These first vehicles, designated as *Sturmhaubitze*, were all manufactured using refurbished *Sturmgeschütz* Ausf E and Fs sent back from the front. The first nine were immediately sent to *Heeresgruppe Süd* and integrated into StuGAbt 185.

Sturminfanteriegeschütz

Parallel to the development of the *Sturmhaubitze*, a further demand was made for a heavily-armed *Sturmgeschütz*. In a *Führerprotokoll* dated 22 September 1942, Albert Speer reported on his conversation with Hitler:

> The fighting at Stalingrad has made it necessary to seek the installation of a heavy gun in a well-armoured vehicle. It must be capable of firing shells with maximum explosive impact to destroy houses using only a few rounds. It does need to have a particularly long range; good vehicle mobility is unimportant. However, heavy armour protection is important. All efforts have to be made to deliver 12 vehicles within 14 days at the latest… If the installation of a sIG 33 in the turret of a PzKpfw III or IV turns out to be impossible, this weapon must be mounted in the hull of the *Sturmgeschütz*.

Due to the very short time available, Alkett, the original manufacturer of the *Sturmgeschütz*, was commissioned with the development of this SP gun. However, the standard gun could not be modified for installation in the limited interior space of a *Sturmgeschütz*. To overcome the problem, 12 refurbished



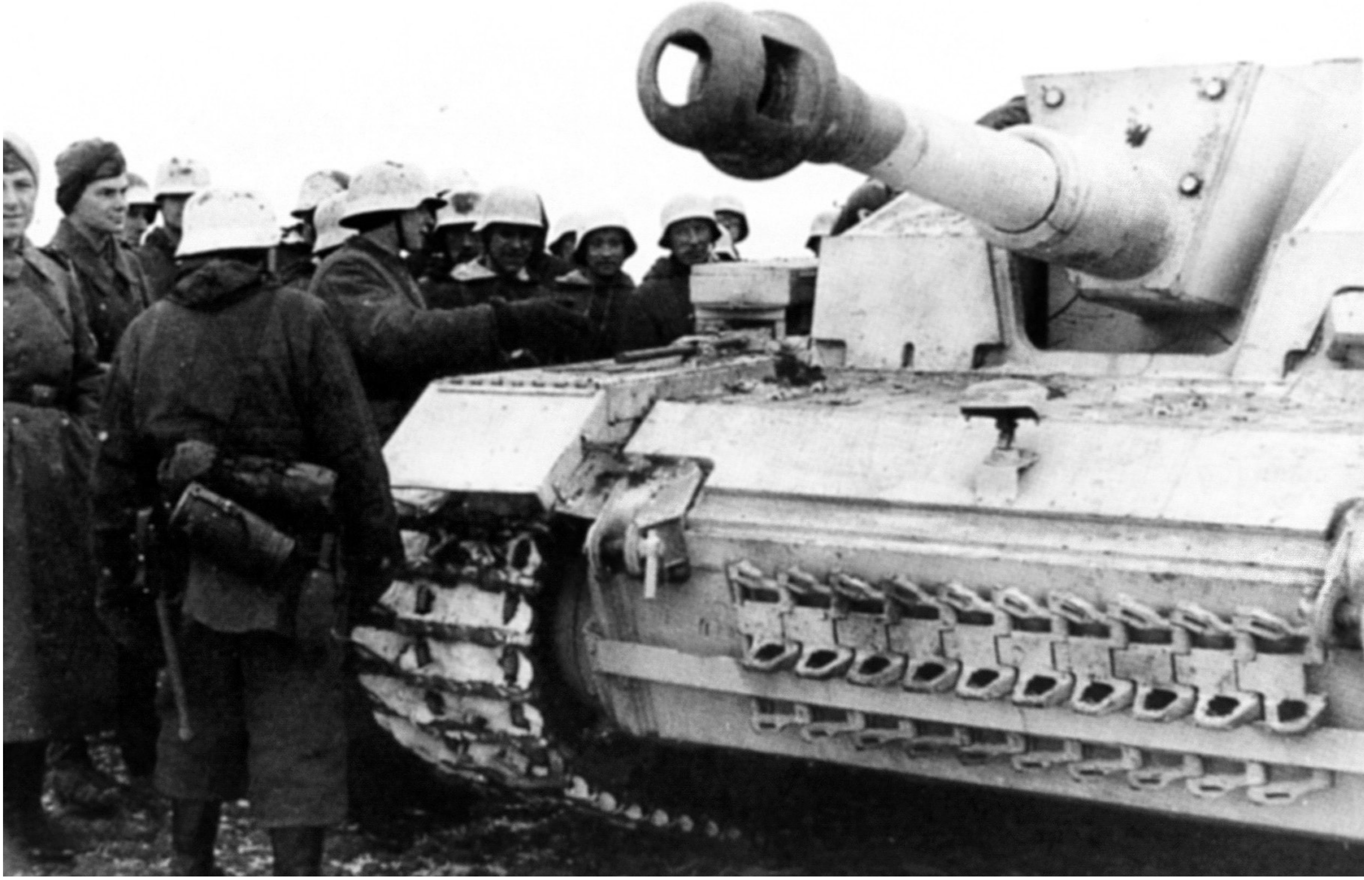
In October 1942, the first 12 sIGs were delivered to StuGAbt 177 and 244. This vehicle from *Abteilung* 244 has been crudely painted in winter camouflage over the standard *dunkel grau* (dark grey). For a reason unknown, the *Winterketten* appear to have been 'shortened'. (Historyfacts)

PzKpfw III hulls were taken from stock. Within a short time, a box-shaped superstructure had been designed which fully surrounded the gun. Since strong armour protection was a requirement, the front of the superstructure was 80mm thick and the sides 50mm thick. There was stowage inside the superstructure for 30 rounds of 15cm ammunition. The superstructure had ample room to allow for the installation of a front-mounted *Maschinengewehr* (MG) 34 for self defence. The vehicle was front-heavy, which made it difficult to steer, and its weight reduced mobility.

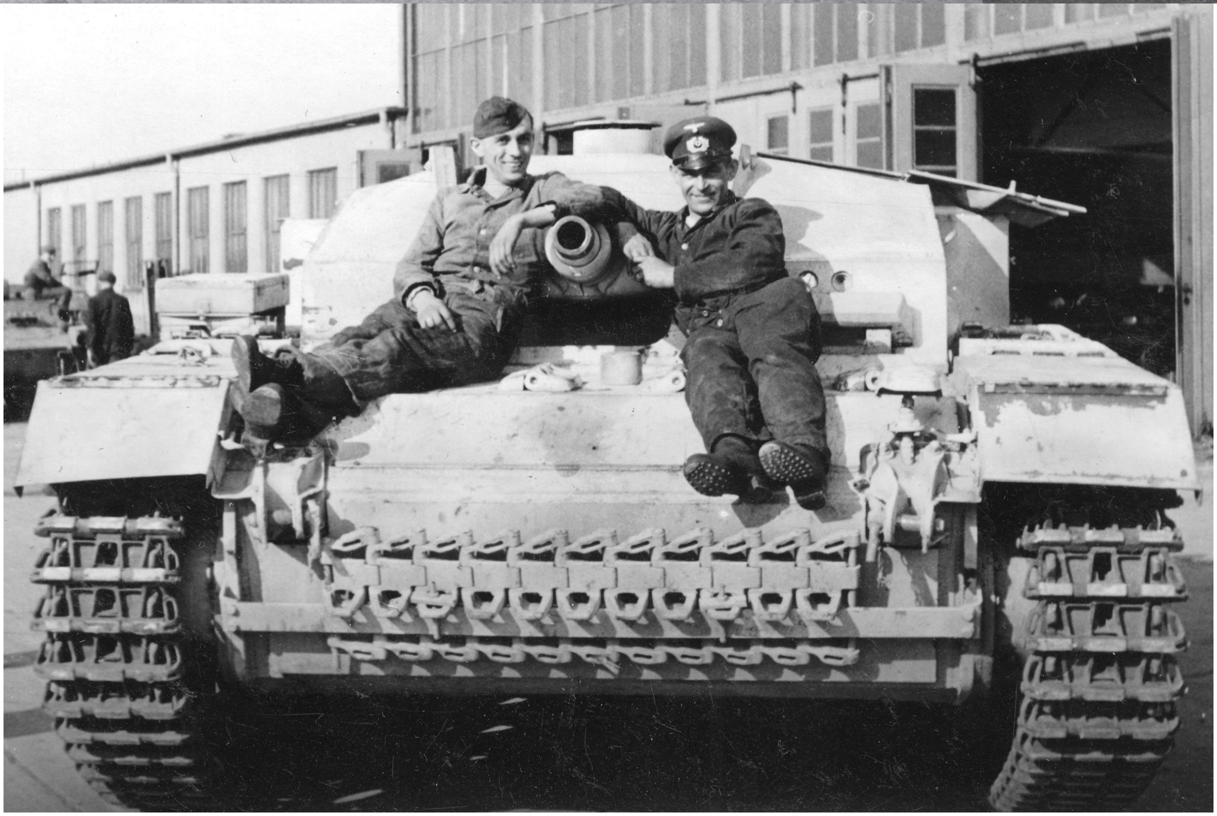
The new vehicles, designated *Sturminfanteriegeschütz*, were put under command of the *Sturmartillerie*. The first production run of 12 vehicles was divided between StuGAbt 177 and StuGAbt 244, at that time both units were involved in the fighting for Stalingrad. Sadly, no documents regarding this deployment have been found.

The second production batch of 12 vehicles was issued to sIG-Bttr-Lehr Btl 17 (a training unit established at the *Artillerieschule*, Burg), which was part of the force sent in an attempt to relieve the 6.Army at Stalingrad. During this commitment, five of the vehicles were lost, and the remaining seven were issued to a combat group called *Gruppe* (Group) Burgstaller. In April 1943, after the collapse of 6.Army at Stalingrad, the depleted 23.PzDiv made a request to take over Burgstaller. On 10 April, it was incorporated in to the division, which at that time was in the process of being re-equipped, and awaiting the arrival of a new *Panther-Abteilung*. It is not certain as to how often the sIG 33-mounted vehicles were used in combat. However, on 28 May 1943, the unit sent an after-combat report to the OKH:

> sIG 33 (Sfl).
>
> Experience of the 23.PzDiv in combat:
>
> We advise close co-operation with tanks, since the SP gun can destroy anti-tank guns and artillery positions at ranges up to 3,500m. Enemy tank assembly positions were effectively obliterated. We note that it is very effective against buildings, also infantry and anti-tank rifle positions. The gun did not achieve direct armour penetration when used against tanks.
>
> Mechanical maintenance is guaranteed only when used in conjunction with a tank regiment.



One of the first *Sturmhaubitze* to be sent to the Eastern Front; early versions of the assault howitzer were based on a production *Sturmgeschütz* Ausf F. Note that the front has been reinforced to 80mm by welding on extra armour plate. The vehicle is also fitted with *Winterketten* to improve mobility.



A *Sturmgeschütz* of an unidentified *Ersatz-Einheit* is a good example of the very mixed establishment found at the training units. Basically, the vehicle is an Ausf F with extra 30mm armour welded onto the front of the chassis, while the superstructure has the standard 50mm and the slopes are filled with concrete. A strange detail is that a *Kurzrohr* (7.5cm K L/24) has been installed in place of the *Langrohr* L/43 or L/48 gun. (Prigent)

> During the assault by our tank forces against concealed positions all were overrun and occupied. An advance in stages was carried out only under the cover of accompanying armoured infantry.
>
> New firing tables are essential as HDv 119/541 is inaccurate. New data has to be provided.
>
> The mounting bolts on the [gun] cradle's armour plate are too weak. The commander's cupola is too small to provide good observation. The hatch impedes vision to the right.
>
> The vehicle is front-heavy. The second running wheels are overloaded. The engine is underpowered and the clutch is too weak, also the brakes wear out too quickly.
>
> Signed: Commander PzRgt 201 sent via 23.PzDiv.

These observations are not surprising, since they represent the basic reservations of many crews against the *Sturmgeschütz*, when not used with care in combat by an inexperienced commander not accustomed to the strengths and weaknesses of the type. However, the report does appreciate the skills of the *Sturmgeschütz* crews that were able to execute missions that could not be carried out by PzKpfw III and IV tanks.

On 11 May 1943, the unit delivered its *Panzerlage* (numerical situation report) which showed that three vehicles were operational while four were receiving repairs. During the period 21 May to 11 July, all seven of their vehicles were reported to be ready for action.

The basic idea of fitting a heavy weapon continued by using the chassis of a PzKpfw IV mounting a 15cm StuH 43 L/12 gun designed and manufactured by Skoda. The type, known as *Brummbär* (Grizzly Bear), was designated as a *Sturmpanzer* to avoid confusion with the *Sturmgeschütz*. In 1943, the *Sturmpanzer* were re-defined by Hitler as *Panzerjäger*, and subsequently all were transferred to the *Panzertruppe*. It is almost certain that Guderian was involved with this incomprehensible decision.

It is interesting to note that the British military had subordinated their comparable equipment under the pioneer service, a more comprehensible decision. However, the *Sturmartillerie* had the *Sturmhaubitze*, a more than acceptable substitute.

In December 1942, the *Organisationsabteilung* decided:

> For *Sturmgeschütz* 10.5cm and 15cm so far only refurbished chassis have been used. Considering their heavy combat usage, these repaired vehicles do not meet requirements. We demand the supply of new production chassis.

Sturmgeschütz Ausf G

At the end of 1942, a major redesign was undertaken. In response to the many experiences and complaints received from front-line troops, many improvements were incorporated by the designers.

The superstructure was substantially enlarged. By making it wider, the conspicuous side pannier boxes could be incorporated, thus eliminating weak points in the armour protection.

The additional internal space now allowed 54 rounds of 7.5cm StuK 40 ammunition to be stowed in the vehicle. However, crews often decided to increase this amount by removing the ammunition stowage bins. Some crews carried 70 or more rounds inside their *Sturmgeschütz* – literally sitting on them.

The limited observation means for the commander was significantly improved by fitting a small rotating cupola which had seven vision slots. A *Scherenfernrohr* (scissors periscope) could be mounted, allowing all-round observation with the hatch closed.

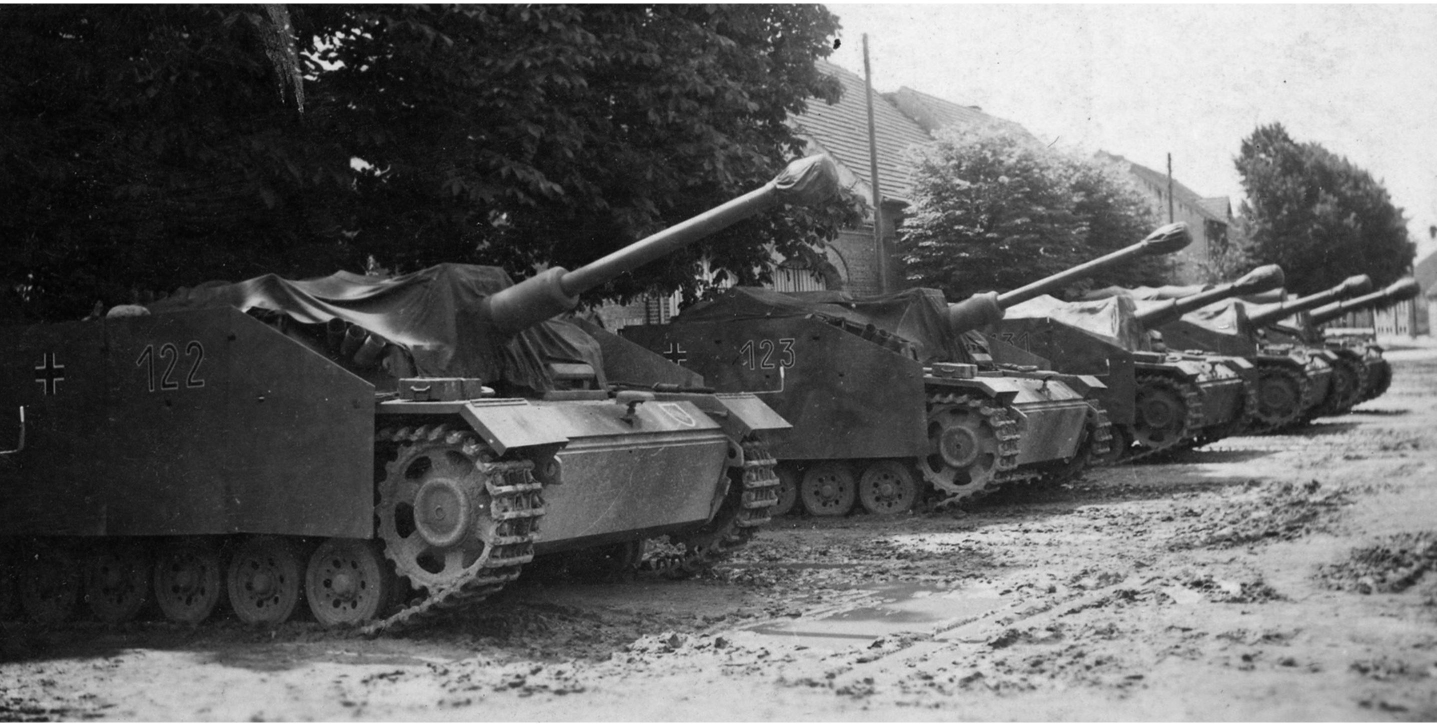
The lack of secondary self-defence armament led to many complaints from front-line units. The Ausf G was designed to carry an MG 34, mounted in front of the loader’s hatch and protected by a foldable armoured shield.

Sturmhaubitze

In March 1943, the *Sturmhaubitze* entered series production, and was based on the latest Ausf G. The vehicle would normally carry 36 rounds of 10.5cm ammunition (an instructional leaflet states 48 rounds).

A leaflet published in May 1944 gave details of the *Sturmhaubitze*:

> Using the same chassis, the gun from the le FH 18 was installed… Production of the *Sturmhaubitze* (StuH) 42 commenced in February 1943, and its introduction



has involved a change in the organization of a StuG Battery. Since that date a *Batterie* consists of seven StuK and three StuH.

Technical data:
Gun-laying devices:
A *Zielfernrohr* (ZF) 1a telescopic sight for direct fire or a *Rundblickfernrohr* (RblF) 36 panoramic sight for indirect fire.

Ammunition:
FH Gr mit AZ 234 (impact fuze)
FH Gr mit DZ S/60 (delay fuze)
FH Gr Nb smoke shell (several versions)
10 cm PzGr (solid anti-tank shell)
10 cm GrPatr 39 *rot* Hl/A to C (HEAT)
Leichtgeschoss illumination round
FH Gr Spr Br combination round HE/incendiary.

Ammunition storage:
48 rounds (10.5cm) stowed in racks

Range of laying mechanism:
Elevation -6° to +20°
Side traverse 20° to both sides.

After being annihilated at Stalingrad, StuGAbt 245 was reformed and re-equipped in April 1943. Three *Sturmhaubitze* and two *Sturmgeschütz* of their 1.*Batterie* are lined up in the street of a German village. In summer 1943, the unit was sent to the central sector of the Eastern Front. (Von Aufseß)

Ammunition for the *Sturmhaubitze*

The *Sturmhaubitze* mounted 10cm *leichte Feldhaubitze* (le FH – light field howitzer) a multi-purpose gun which had been used in large numbers and over a long period by the field artillery. As it was designed as a field artillery gun, the ammunition was produced in two parts: a shell and a cartridge.

Numerically, the most important type of ammunition was the *Feldhaubitzgranate*, the standard high-explosive (HE) round. A wide variety of fuzes were available, which included impact or time-delay types. However, for reasons of practicability the ammunition was supplied with the shell and cartridge as one item.

For combat against armoured targets the 10cm GrPatr 39 *rot* HL (hollow charge/HEAT) round was available. Introduced in October 1943, the HL/C was the most powerful and effective round. Unlike all other types, it was delivered as an integrated item (shell attached to the cartridge case) to ease and accelerate the rate of fire. A 10cm GrPatr 39 shell could penetrate 100mm of armour at an impact angle of 60°.

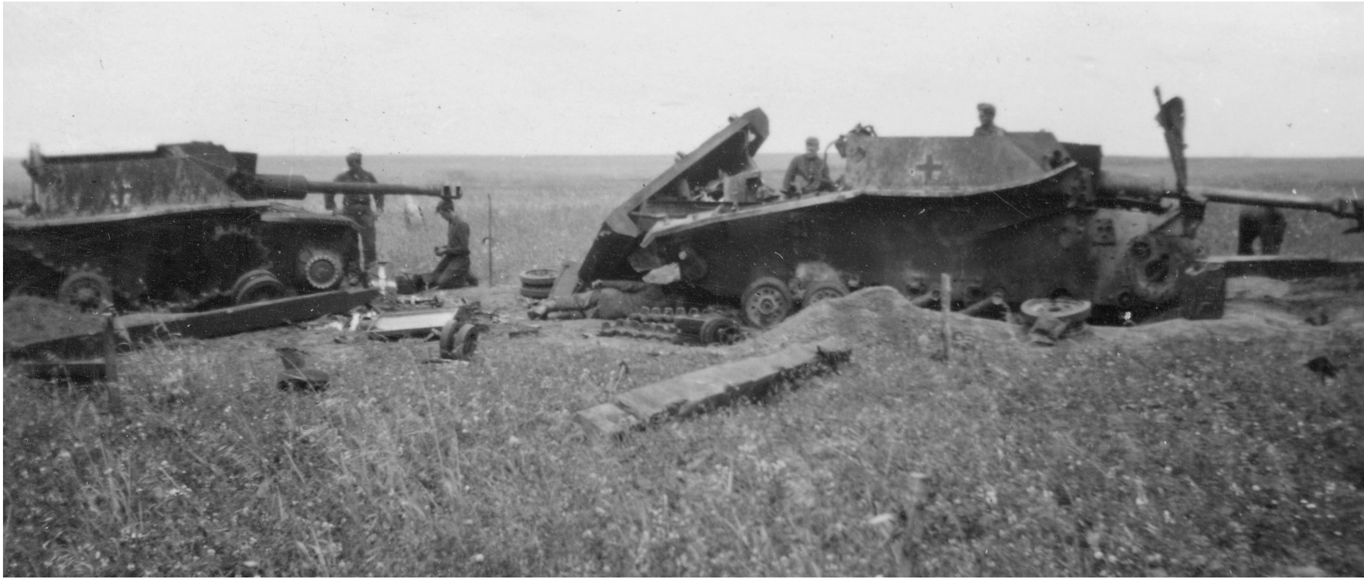
Sturmhaubitze were supplied to units at a fixed rate, providing each battery with seven 7.5cm-armed vehicles and three *Sturmhaubitze*. However, a unit commander was given the 'freedom' to organize his unit according the tactical requirements.

Ammunition Supply

The *Verbrauchsätze* system for the provision of ammunition was adapted over the years. An OKH document, dated 15 January 1943, provides information:

> Ammunition:
> The following quantities of prime ammunition are authorized:

Prior to Operation *Zitadelle* (Citadel), Soviet defenders had laid a large number anti-tank mine fields often 'enhanced' by burying German heavy artillery shells under the mines. Both these *Sturmgeschütz* of StuGAbt 177 have been badly damaged, and have been taken to a spare parts depot. (Anderson)



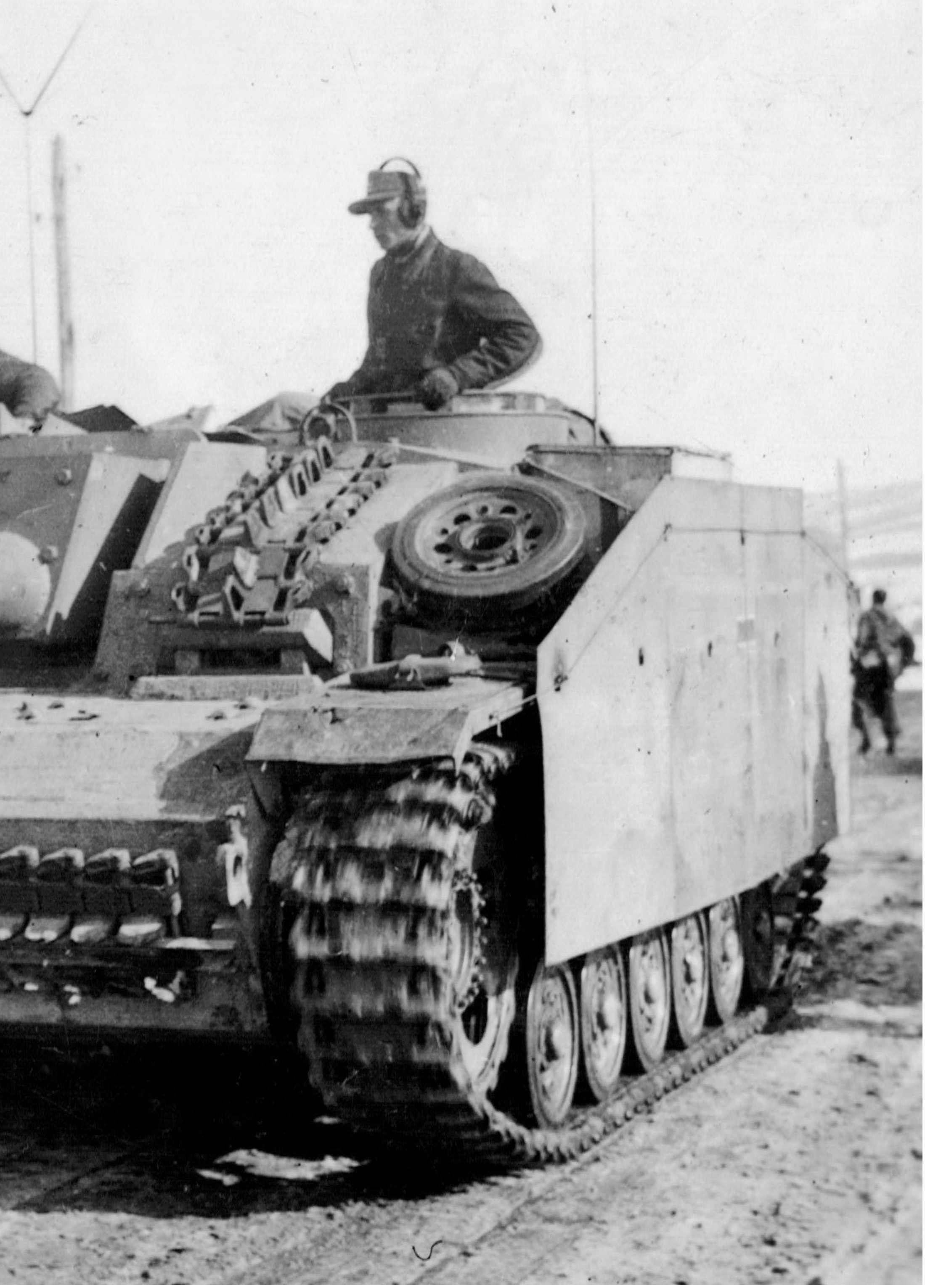
During Operation *Zitadelle*, German units in Russia encountered the SU-152 heavy self-propelled gun for the first time. Here, men of StuGAbt 245 take a closer look at a battle-damaged SU-152, which was designed by the Soviets to fight the PzKpfw VI Tiger tank. (Anderson)

StuGs equipped with 7.5cm K *kurz*.
Rounds per gun:
270 x 7.5cm GrPatr 38 Hl KwK
30 x 7.5cm NbGr Patr KwK

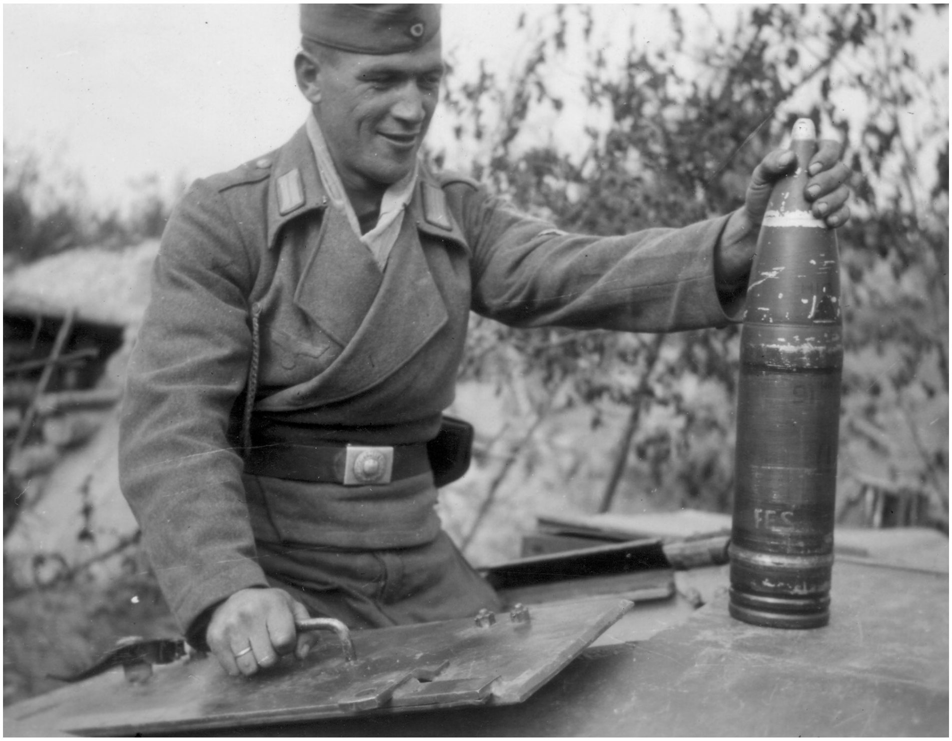
StuGs equipped with 7.5cm StuK 40.
Rounds per gun:
150 x 7.5cm SprGr Patr 34 KwK 40.
108 x 7.5cm PzGr Patr 39 KwK 40.
30 x 7.5cm PzGr Patr 40 KwK 40.
12 x 7.5cm NbGr Patr KwK 40.

StuGs equipped with 10.5cm StuH 42.
Rounds per gun:
162 x FH Gr with impact fuze.
9 x FH Gr with combination fuze.
36 x 10cm Gr 38 rot HL/A or HL/B.
18 x FH Gr Nb with impact fuze.
225 x *Hülsenkartusche* le FH 18 semi-fixed cartridges.
108 x *Sonderkartusche* [special cartridges].
The *Sprengpatrone* Z, or similar demolition charge, used to destroy a gun barrel or a tank.

A test firing, dated 26 June 1943, yielded the following results for the 10.5cm le FH 18 using HL/A and /B ammunition:



A *Befehls-Sturmgeschütz* (command vehicle) from an unidentified unit passes a captured Russian truck in the spring of 1944. A *Sternantenne* (star antenna) ‘d’ is mounted of the rear right-hand side of the superstructure. (Anderson)



The 10.5cm *Sturmhaubitz* (assault howitzer) 42 fired standard artillery two-piece ammunition. The 10.5cm Gr 39 *rot* (red) HL/A or /B, hollow-charge round, was used to fight armoured targets. In 1944, the type was changed to an integrated shell and cartridge round for easier loading, which resulted in a more rapid rate of fire. (Anderson)

Target: Russian PzKpfw KV-I (44t):

> Range 400m, target the turret, hull, and/or the suspension (side).
> HL/A and B: No impact on spaced armour. Basic armour was not penetrated. A hit on the gun-recuperator housing [mantlet] penetrated the armour, but the gun was not damaged. An impact destroyed the track and running gear, which would have immobilized the tank.

Other after-action reports detail somewhat better results. However, the StuH was only to fight an enemy tank in self-defence.

Improving Survivability

During a *Führerkonferenz*, Speer noted the following conversation with Hitler on 18 January 1943:

> 16) With regard of the effects of the Russian anti-tank rifles the *Führer* considers it necessary to increase the side armour protection on the *Panzerkampfwagen* to 60mm, and on the *Sturmgeschütz* to 50mm.

Then on 7 February 1943:

> 31) The *Führer* considers the side armour plates [*Panzerschürzen*] intended to offer protection against anti-tank rifles for Panzer III, IV and *Sturmgeschütz* to be very useful.

The directives dealt with a defined threat to any German armour. To defeat the attacking German units, the Red Army relied on massed 37mm to 76.2mm anti-tank guns; the backbone of their front lines. If these were skillfully used, any attack on a sector defended by dug- in anti-tank guns could end in disaster. Also, the Soviet infantry were equipped with significant numbers of 14.5mm anti-tank rifles, which they used together with 'Molotov Cocktails' and mines. The simple-to-manufacture, inexpensive and easy-to-handle anti-tank rifle, was powerful enough to penetrate the 30mm side armour of a PzKpfw IV and a *Sturmgeschütz* at close range. The commander's cupola was especially vulnerable; any penetration by a 14.5mm round could severely injure or even kill the commander. After-action reports give details of Soviet anti-tank snipers targeting the optics, drive sprockets and on occasion, the rubber tyres on the running wheels.

Front-line *Sturmgeschütz* units attempted to eliminate the problem by using any available material. Shell traps were sealed with layers of concrete or covered by steel plate, and spare track links were mounted along the sides of the superstructure.

Panzerschürzen

By early 1943, German engineers had developed side skirts (spaced armour) to protect the tanks and *Sturmgeschütz*. The *Panzerschürzen* (tank skirts), fabricated from 5mm-thick armoured steel, were fitted to all production *Sturmgeschütz* from the middle of that year. Since these plates were regarded as essential for the planned offensive on the Kursk salient, large numbers were sent by priority rail transport for installation in the field.

The *Generalinspekteur der Panzertruppen* noted on 3 May 1943:

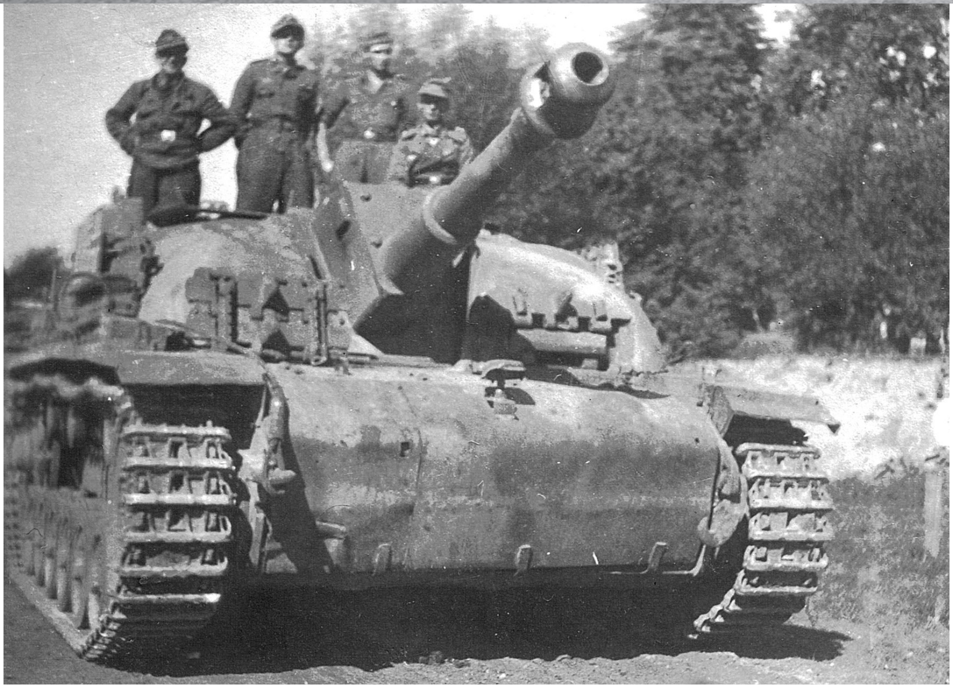
> III) During May, the *Ostheer* (army in the east) will receive
> 475 *Schürzen* for Panzer III
> 320 *Schürzen* for Panzer IV
> 350 *Schürzen* for *Sturmgeschütz*.

How they were distributed is shown in this note from the *Organisationsabteilung*, also dated May 1943:

> 27 May: 545 PzInst Abt has prepared 30 *Panzerschürzen* kits for each division which have to be picked up by the respective units.

In general the troop was enthusiastic about *Panzerschürzen* which, if mounted correctly, offered reasonable protection against the anti-tank rifle. However, there were also dissenting opinions, as shown in this report from 20.PzDiv dated 27 May 1943:

> Experience report on *Panzerschürzen*.
>
> PzAbt 21 currently has five PzKpfw fitted with *Panzerschürzen*.



The crew of this *Sturmhaubitze*, have attempted to improve armour protection on their vehicle by a applying a thick layer of concrete to the front of the superstructure. Also they have attached track links taken from a Russian KV heavy tank and a large metal sheet has been fitted over the concrete on the front plate as spaced armor. (Anderson)

> The additional steel plates protect against shells with contact fuzes, anti-tank rifles and magnetic explosive charges. There are, however, substantial disadvantages. The complete mounting framework proved to be too weak. Even a light collision with an obstacle, such as a tree stump, will bend the brackets. While driving through soft ground, mud can accumulate between track, track covers and *Panzerschürzen* resulting in an increased traction resistance. During dry weather, dust and sand will be dragged up between the hull and skirts, potentially clogging the air inlets. The cooling radiators will become clogged within a short time… *Panzerschürzen* also complicate any repair to the suspension (changing road wheels and fitting track links). Explosive devices that cannot roll off become stuck between the *schürzen* and the vehicle.

However, such negative reports were the exception. Engineers in front-line *Sturmgeschütz* units made 'in the field' modifications to strengthen the *Panzerschürzen* brackets.

Zimmerit

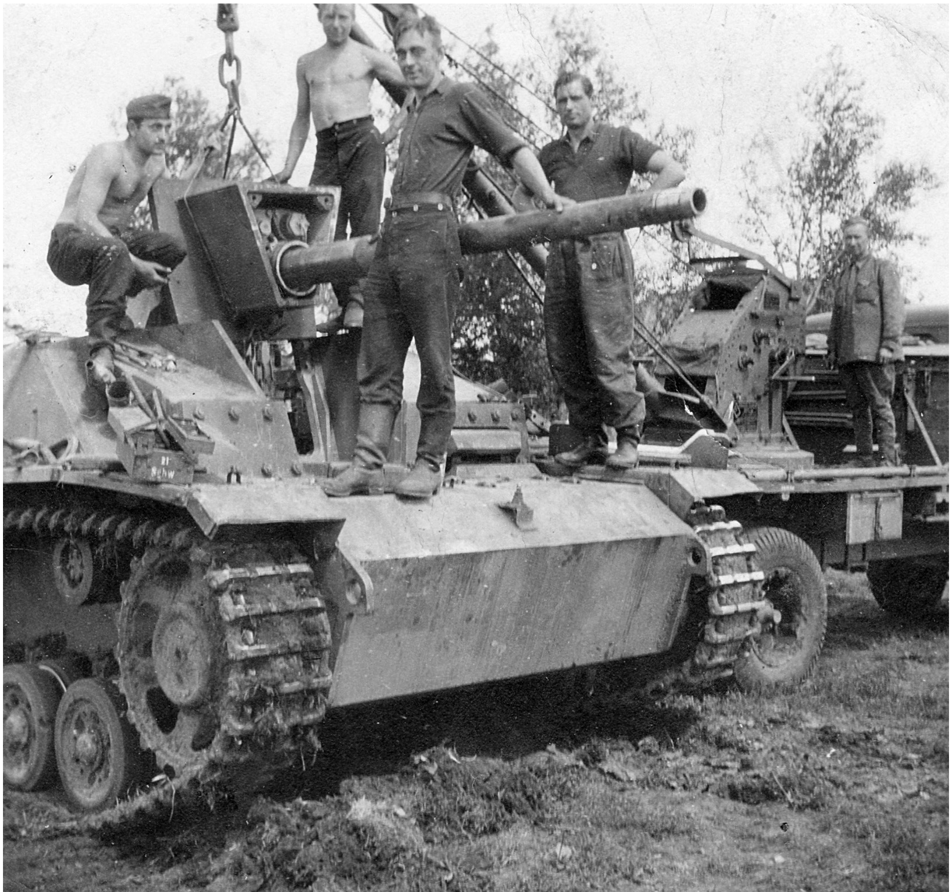
From December 1943, an anti-magnetic paste-like coating called '*Zimmerit*' was introduced for all tanks and *Sturmgeschütz*. This coating was applied at the factory or during refurbishment, and occasionally on the battlefront. The coating was produced to prevent magnetic explosive HEAT devices from adhering to the metal armour. '*Zimmerit*' was withdrawn from use in September 1944.

Tactical Changes

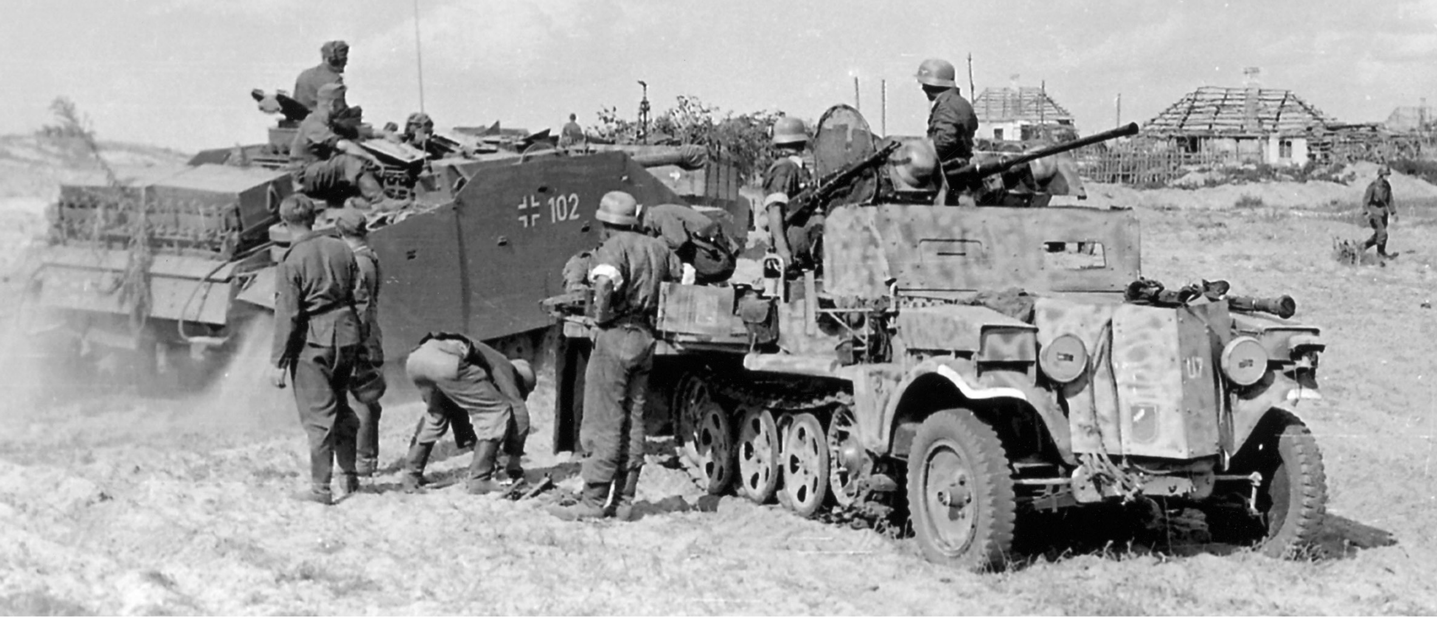
The *Sturmgeschütz* was developed and entered service as an infantry support weapon that was primarily allocated to infantry divisions, and also to *Panzerdivisions* for their *Schützenregiment*. The task of the *Sturmgeschütz* as defined at the beginning of the war proved to be correct, and was to remain basically unchanged. However, the leaflet '*Richtlinien für den Einsatz der Sturmartillerie*' (rules for commitment of the assault artillery), published in April 1942, had some changes added after experience gained during the first combat missions in Russia:

> 1. The *Sturmgeschütz*… is an attack weapon…
>
> 3. Cross-country mobility, armour protection and their steady readiness to fire allows the *Sturmgeschütz* to follow the infantry attack providing concentrated artillery support at all effective combat ranges. *Sturmgeschütz* will give the infantry attack impact and speed, and a strong morale backing.
>
> 4. The *Sturmgeschütz* follow the infantry, moving from firing position to firing position. Fire will be opened only directly from the halt. Due to its weak side armour the *Sturmgeschütz* is vulnerable in close combat. Its own self-defence capabilities are limited, the main ordnance has effect only to the front.

This is obviously a repetition of the initial designated task for the *Sturmartillerie*, which was based on experience gained in World War I-vintage *Begleitartillerie* (escort artillery). Item 4 in the report above places emphasis on the main shortcomings of the design – if incorrectly deployed, the *Sturmgeschütz* would be defeated. When attacking Red Army positions they were threatened with



Men from the workshop of StuGAbt 245 have taken the roof plate off the superstructure to allow them to remove the gun. The vehicle in the background is a Kfz 100 *Drehkran-Kraftwagen*, fitted with a 3-ton capacity rotatable crane. (Anderson)



A *Sturmgeschütz* of StuGAbt 905 passes a SdKfz 10/5 halftrack 2cm SturmFlaK (assault anti-aircraft) cannon from an infantry unit. During an attack, the *Sturmgeschütz* would operate in close cooperation with these versatile vehicles. The main benefit of the type was that the crew of the 2cm cannon could quickly open fire against any enemy position. The radiator and the driver's compartment on the SdKfz 10/5 were partially protected with armour plate. (Anderson)

destruction by a determined enemy using anti-tank rifles, hand grenades or even a 'Molotov Cocktail'. If a *Sturmgeschütz* was immobilized then the crew would have to open the hatches and engage the enemy with small arms; a very dangerous situation. German infantry leaders unaware of the type's strengths and weaknesses tended to send them to spearhead an infantry assault. Furthermore, the morale of the forward infantry was important; weak or insufficiently trained forces that ran into a dangerous situation when confronted by a superior enemy force all too often hastily called for *Sturmgeschütz* support.

Also, the appearance of larger numbers of enemy tanks led to excessive demands being made on the *Sturmgeschütz*, which were usually subordinated in battery strength only where all directives called for an entire *Abteilung*.

The leaflet correctly continues:

> 8.) The breaking up of *Sturmgeschütz* units into their smallest parts (platoon, or a single vehicle) reduced their firepower.

This experience was valid, as confirmed in a combat report by 296.Infanterie Division detailing the fighting of summer 1942:

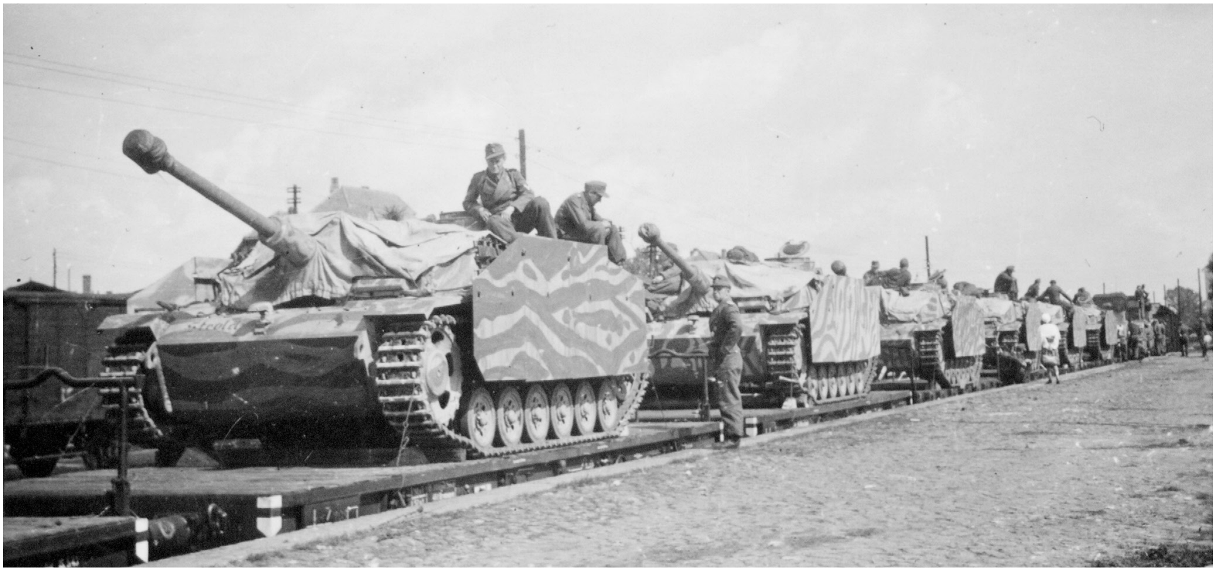
> The *Sturmgeschütz* is an attack weapon, and had to be used accordingly, but also in defence. To enable a quick and timely reaction to enemy attacks, the *Sturmgeschütz* have to be positioned 2 to 3km behind the main front line. Commitment of a single *Sturmgeschütz* has proved to be wrong. The normal commitment should be as a platoon (minimum), and if possible the entire battery… During any battle the infantry have to provide cover for the flanks and rear of the *Sturmgeschütz*… After nightfall, any combat by the *Sturmgeschütz* has to be rejected. When engaging enemy tanks escorted by infantry, the *Sturmgeschütz* have to be protected by our own infantry in all instances… The *Sturmgeschütz* shall not, under any

> circumstances, be used as a tank destroyer. Even when in well-camouflaged positions on the front line they will be quickly observed and neutralized. A dug-in *Sturmgeschütz* is useless, since the type is difficult to traverse.

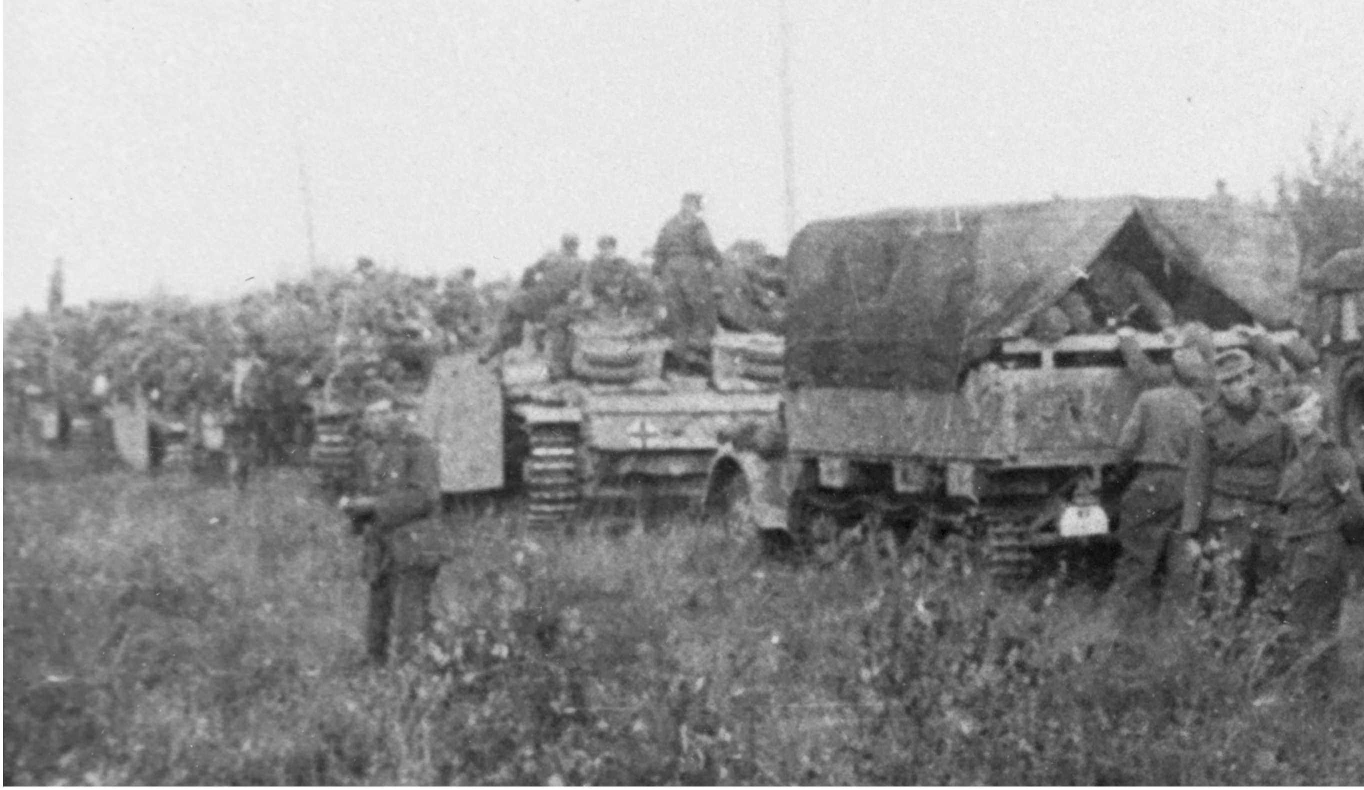
By the end of 1941, the structures for the *Panzerdivision* 43 or *Neue* (new) *Panzerdivision* had been decided, and the slow process began of reorganizing more and more to this standard. The less mobile infantry elements of a *Schützenregiment* were replaced by *Panzergrenadiere* equipped with armoured personnel carriers.

In April 1943, StuGAbt 232 was subordinated under 7.PzDiv, which had already been brought to this standard. An interesting after-action report was submitted in May 1943:

> Tactical experience:
> With the exception of very few instances, the commander was never able to lead his entire *Abteilung* into the battle from his vehicle; even the deployment of entire batteries was a rarity. While subordinated under 7.PzDiv, the division retained control for the deployment of a single *Sturmgeschütz*. A lone *Sturmgeschütz* was often neutralized by a minor problem. Since the division decided to deploy the *Sturmgeschütz* directly without informing the staff echelon, the *Abteilung* did not always know their position, status or their subordination. This is an unacceptable situation.
>
> The following ways of combat were identified:
>
> 1.) The combat of *Sturmgeschütz* supported by dismounted *Panzergrenadiere* was decisive after a short time. This type of combat resulted in great successes with only a few casualties among the *Panzergrenadiere* and light damage to the *Sturmgeschütz*. During these commitments no total losses were recorded. Both



Sturmgeschütz of StuGAbt 276 loaded on railway wagons for transport to the front line. Established in the summer of 1943, the unit was sent to Fastov, near Kiev to assist 2.PzDiv. The newly delivered vehicles do not have a factory-applied '*Zimmerit*' coating, but are fitted with *Panzerschürzen*. The *Sturmgeschütz* to the left has been named '*Strolch*' (rascal) by the crew. (Münch)



Elements of StuGAbt 276 begin preparations for an attack. Infantry have already mounted the assault guns. In the column is a *Sturmgeschütz* Ausf G, a 3-ton *Maultier* half-tracked supply truck and a Steyr Kfz 21, heavy passenger car. (Anderson)

Panzergrenadiere and *Sturmgeschütz* were fully aware that they depended on each other, a great mutual understanding and cooperation developed.

2.) Combat using our *Sturmgeschütz* with *Schützenpanzerwagen* [SPW – armoured personal carriers] had a negative effect on the *Abteilung*. The *Panzergrenadiere* rarely dismounted from their SPW. Since these travelled much faster than the *Sturmgeschütz* our flanks were soon unprotected, the *Panzergrenadiere* passed many pockets of resistance without noticing them. These enemy forces soon became a problem for the *Sturmgeschütz*.

3.) Cooperation with tanks showed the following problems:
a) There is the general opinion that a *Sturmgeschütz* is equal to a tank, and most previous deployments relied on this assumption. We are gradually succeeding in persuading others that the *Sturmgeschütz* cannot be compared to a tank in respect of mobility and range of deployment.
b) It is a disadvantage that only one *Sturmgeschütz* in the *Abteilung* can communicate via radio with the tanks, because our radios work on a different waveband. Thus a single *Sturmgeschütz* deployed with tanks remained isolated.
c) During the assault, the *Sturmgeschütz* could not keep up with the speed of the tanks. Left alone by the faster tanks, our flanks were unprotected again. This led to avoidable total losses.
d) When encountering heavy enemy resistance the tanks tended to turn off without informing the *Sturmgeschütz*. This resulted in further losses.
e) When entering built-up areas the *Sturmgeschütz* were always sent in first, the

> tanks followed firing to all sides. When the *Sturmgeschütz* had broken the initial resistance, the tanks, left leaving our flanks undefended. In the following fighting we had losses among our commanders from attacks by snipers and hand grenades.

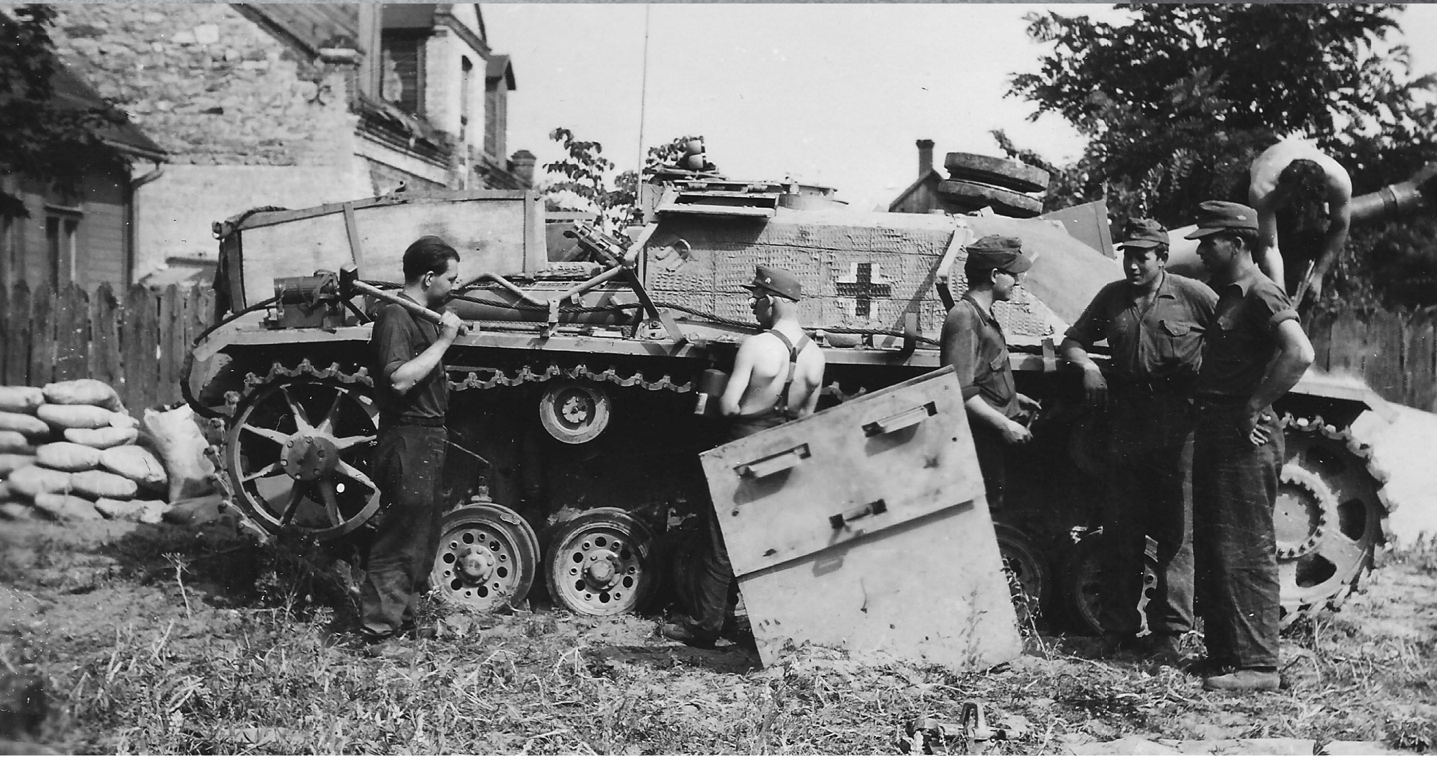
The report underlines again the fundamental problems regarding the appropriate deployment of *Sturmgeschütz*, if subordinated under different branches, or led by inexperienced leaders. In such cases, units suffered heavy losses, but many would have been avoidable, if only experienced *Sturmartillerie* officers had been in charge of the vehicle. The example of StuGAbt 232 shows that total losses of *Sturmgeschütz* arose only when being deployed to assist a tank assault or alone without infantry assistance. Lacking direct flank protection, the *Sturmgeschütz* were engaged in close combat by enemy anti-tank teams. However, when accompanied by dismounted *Panzergrenadiers*, enemy anti-tank gun or anti-tank rifle positions were quickly located and attacked by the *Sturmgeschütz*.

In his report, the commander of StuGAbt 232 pointed out the high score of his *Abteilung* during their period of subordination to 7.PzDiv from 7 January to 12 March 1943:

> StuGAbt 232 noted the following score:
> 154 tanks, 135 anti-tank guns, 61 anti-tank rifles, 27 grenade launchers.
> 130 machine guns, 82 trucks, 61 armoured cars, 29 artillery guns.
>
> Our losses were comparatively low:
> 12 *Sturmgeschütz*, three trucks, one Volkswagen, eight heavy motorcycles.

Sturmgeschützlage 1 July 1943

Heeresgruppe	StuG Abt	StuG Bttr	Unit status	StuG status	*kurz*	*lang*	StuH
Nord	184			Combat ready	8	21	
				In workshop	1	3	
	226			Combat ready		30	
				In workshop		3	
	912			Combat ready		21	9
				In workshop		1	
		741		Combat ready		10	
				In workshop			
		742		Combat ready		10	
				In Workshop			
Mitte	177			Combat ready		21	8
				In workshop		1	1
	202			Combat ready	6	22	
				In workshop	1	2	
	904			Combat ready		28	
				In workshop		3	
	189			Combat ready		30	
				In workshop		1	
	270			Combat ready	1	19	
				In workshop	4	1	
	667			Combat ready	3	26	
				In workshop		2	
	185			Combat ready		26	4
				In workshop		1	1
	190			Combat ready		22	9
				In workshop			
	245			Combat ready		22	9
				In workshop			
	600			Combat ready		22	9
				In workshop			
	909			Combat ready	2	24	
				In workshop	2	3	
Süd	203			Combat ready		30	
				In workshop		1	
	210			Combat ready		23	
				In workshop		6	
	243			Combat ready		30	
				In workshop		1	
		393		Combat ready		11	
				In workshop		1	
	209			Combat ready		26	
				In workshop		3	
	232			Combat ready		27	
				In workshop		6	
	911			Combat ready		22	
				In workshop			
	228			Combat ready		26	
				In workshop		5	
	GD			Combat ready		32	
				In workshop		3	
	905			Combat ready		23	9
				In workshop			
		247		Combat ready		7	
				In workshop			
	A	249		Combat ready	3	29	
				In workshop	4	5	
	191			Combat ready		27	
				In workshop		4	
Südost	201					22	9
				Totals	**35**	**745**	**68**



The crew of a *Sturmhaubitze* Ausf G is repairing a damaged mounting on the *Panzerschürtzen*, which is carried on the later, more rugged triangular-type supports. A second smaller plate reinforces the upper section. A factory-supplied frame is mounted on the engine deck for the stowage of the crew´s personal equipment: Note that concrete has been added to the front slope on the superstructure. (Anderson)

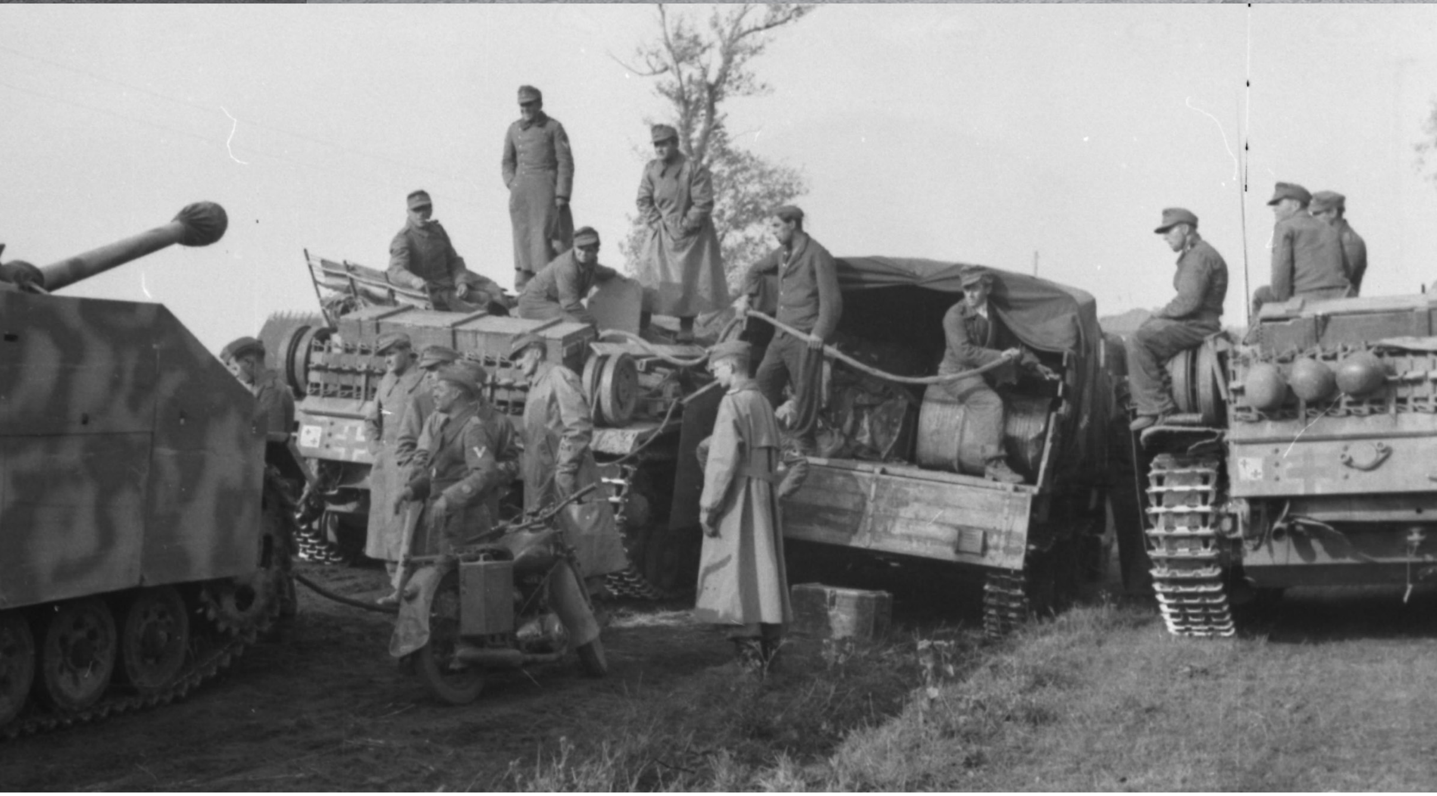
As a result, close cooperation with the infantry was a prerequisite for a successful assault.

In the summer of 1943, a decisive battle was raging around Kursk. Between 5 and 16 July, *Heeresgruppen Nord* and *Süd* attempted to launch an attack, which involved *Sturmartillerie* units, in order to cut off and encircle the city. After only 14 days, German forces stopped their offensive possibly due, in part, to Allied forces landing on Sicily on 10 July 1943.

Although the overall losses were not significant, this retreat was indeed a defeat, as the German military had lost the strategic initiative. From now on, German forces were compelled to defend rather than attack.

In August 1943, *Oberstleutnant* (Lt Col) Hellmut Christ, the commander of StuGErsAusbAbt 200, travelled to the Eastern Front in order to gather first-hand knowledge as to the combat situation of several *Sturmgeschütz* battalions. He noted:

> The following *Sturmgeschütz-Abteilungen* were visited:
> StuGAbt 912 south of Lake Ladoga
> StuGAbt 184 south of Lake Ilmen
> StuGAbt 185 east of Smolensk
> StuGAbt 270 southeast of Smolensk
> StuGAbt 904 east of Chernigov
> StuGAbt 243 northeast of Melitopol
> StuGAbt 226 south of Lake Ladoga
> StuGAbt 190 northeast of Smolensk
> StuGAbt 189 southeast of Smolensk
> StuGAbt 600 southwest of Brjansk
> StuGAbt 191 Kuban bridgehead
> StuGAbt 210 east of Zaporozhye
> *Heeresgruppe Nord* was in consolidated positions and not involved in any major fighting, while *Mitte* and *Süd* were engaged in defensive and withdrawal operations. All such movements were undertaken according to plan. I observed that on no



Three *Sturmgeschütz* from StuGABt 244 being refuelled from a 3-ton *Maultier* (mule) half-tracked supply truck in the summer of 1943. A number of large wooden boxes, extra spare tracks and running wheels are stored within the frames on the engine covers. (Anderson)

occasion was there a panic-stricken withdrawal and that no equipment was abandoned. The troop regretted abandoning ground gained, but is convinced that the final defeat of the Russian will come soon, since his combat value is regarded as being poor. During the withdrawal everything was systematically destroyed: built up areas were set ablaze, bridges were blown up, also railway tracks and roadways were made unusable. The local population was evacuated and all cattle were transported to our positions in the west. Unfortunately, all the wheat and corn found had to be left behind.

Assessment of the enemy:
The Russian infantry is in general of poor quality, and will only attack when supported by tanks. Even then they suffered incredibly high losses. There is no leadership at all… Captured orders prove that for every five Russian soldiers there is a Commissar, and a Supreme Commissar is responsible for every five Commissars. These men are ruthless and coerce their infantry into the attack.

The Russian artillery became very effective. Prior to any assault, German positions were shelled with a vast amount of ammunition, including grenade launchers and Katyusha rockets.

The Russian tanks have become less effective. Their crews are well chosen and well disciplined, but insufficiently trained. According to captured Soviet orders they are forbidden to engage in combat against the *Sturmgeschütz*.

The number of Russian anti-tank guns, which have become more powerful and accurate, has considerably increased. These guns are skilfully used and feared by all *Sturmgeschütz* crews. Also, anti-tank rifles and mines are the most dangerous defence weapons against the *Sturmgeschütz*. The fire from an anti-tank rifle can penetrate the commander's cupola.

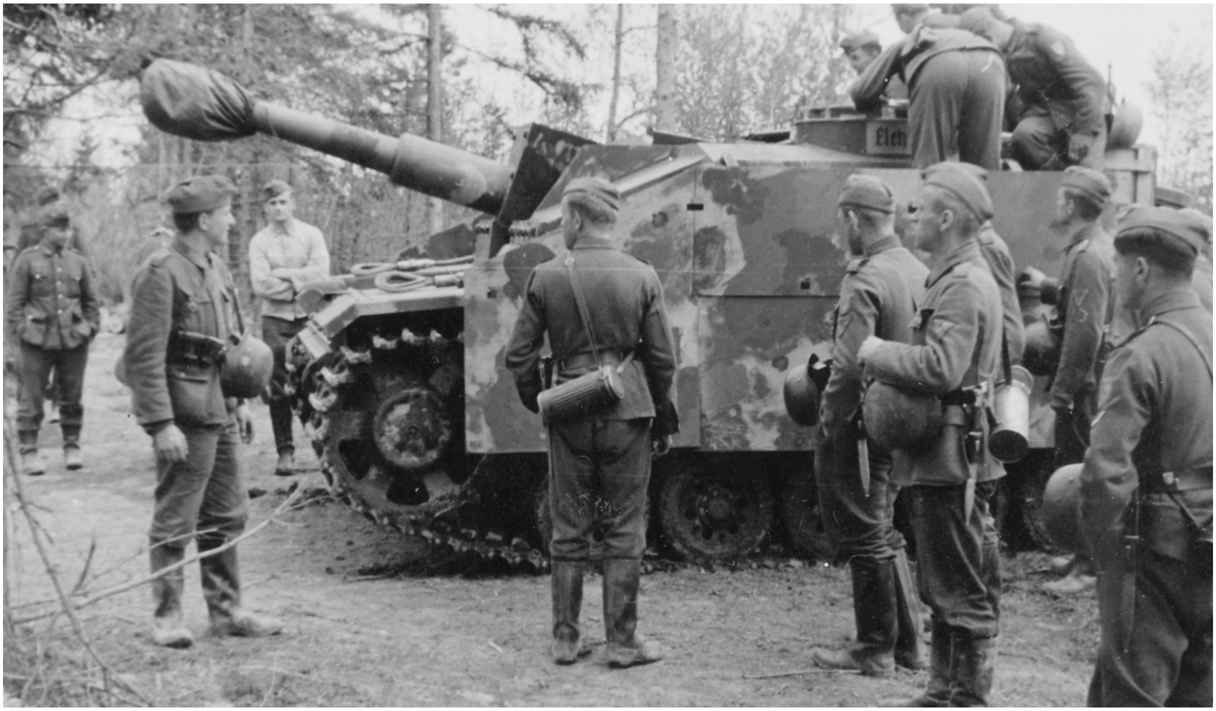
Assessment of own weapons:
The German infantryman is exhausted, disillusioned, numerically weakened and the lack of commanders and non-commissioned officers causes more problems. It is the unanimous opinion of all *Sturmgeschütz* crews that we could chase the Russians to the Urals if we had a more dedicated and belligerent infantry.

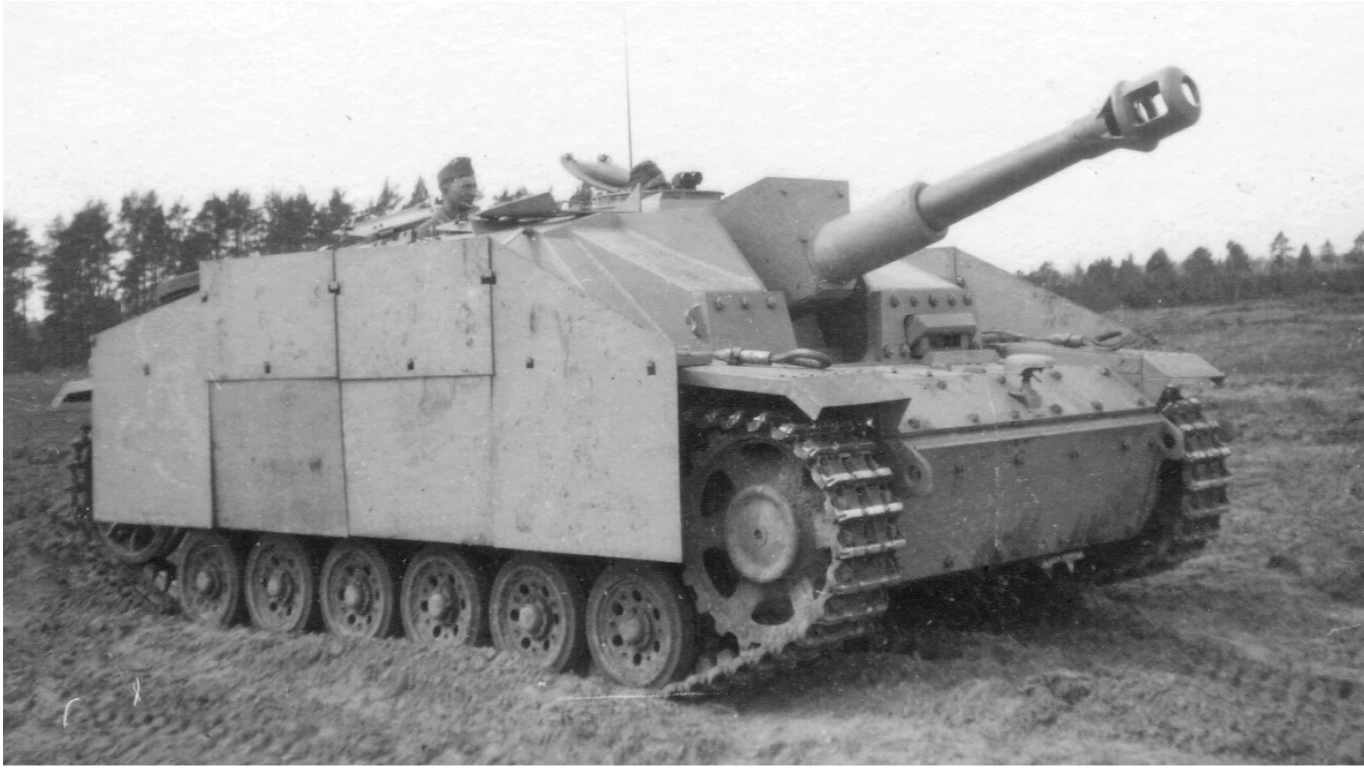
The German artillery is first class, and is the backbone of front-line forces. If the infantry withdraws, the *Vorgeschobener Beobachter* [VB – forward observer] will remain in his position.

In the current fighting, the German Panzers have merely to exist when compared with the *Sturmgeschütz*. This is proved by the following reasons:

1) The tank operates in wide open terrain, and is used to advance and encircle. Direct conflict with a Russian tank is to be avoided, and is not to be used to support an assault by German infantry.
2) The armour protection and optics on a Panzer are inferior to those on the *Sturmgeschütz*.
3) The Panzer is considerably higher than the *Sturmgeschütz*, making it easier to observe then attack and destroy.
A senior officer told me: "I prefer a *Sturmgeschütz-Abteilung* to a *Panzerdivision*". Another regimental commander stated: "Two *Sturmgeschütz* are more useful than ten tanks."

A *Sturmhaubitze* of StuGAbt 912 carries the name '*Elch*' (elk) painted on the commander's cupola. The vehicle is painted in a tri-tone camouflage scheme (chocolate brown and dark green 'stripes' over the dark yellow base coat). The *Panzerschürzen* has been reinforced by two smaller steel plates. (Anderson)



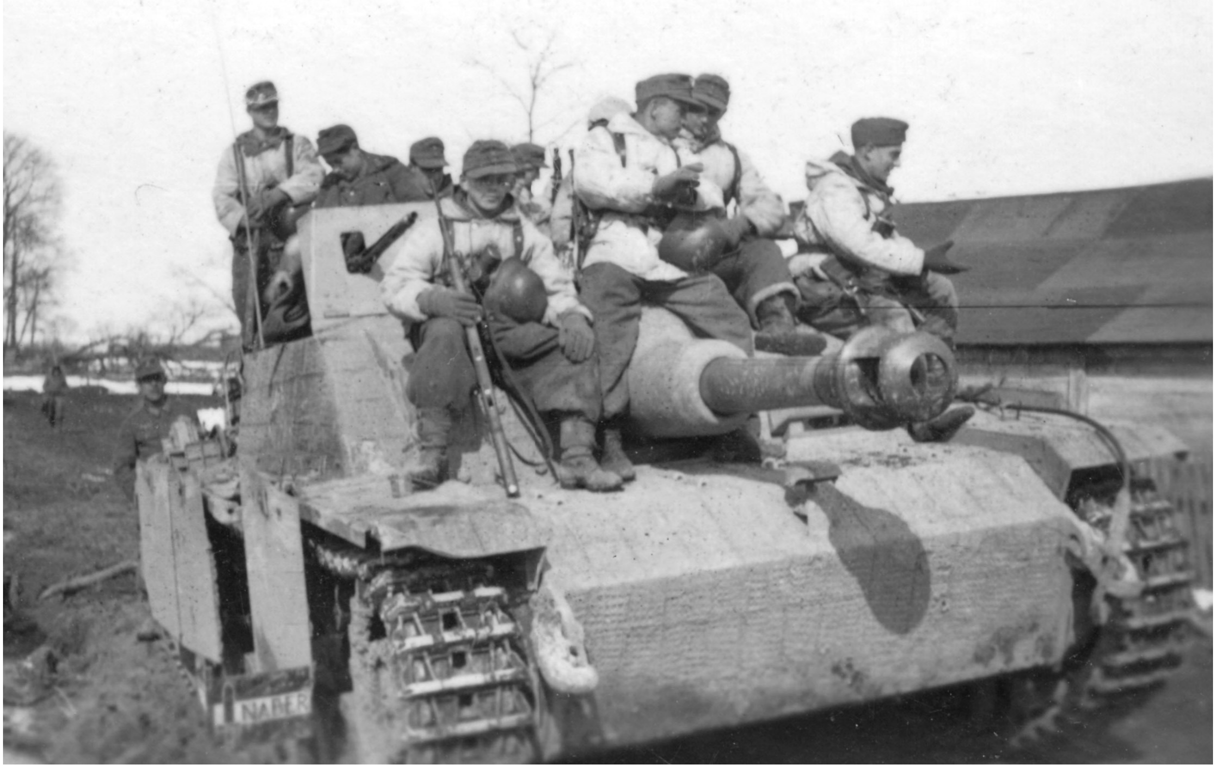


A *Sturmhaubitze* in the autumn of 1943: The vehicle has the original rigid side-skirt mountings, with a double set of plates to protect the crew compartment. Additional 30mm armour had been bolted to the front of the chassis and to that of the superstructure. (Von Aufseß)

The *Sturmgeschütz* is the most valuable combat vehicle… Wherever enemy tanks break through, *Sturmgeschütz* will be called for. The *Sturmkanone* [StuK] is superior to every Russian tank. Following the massive success of the *Sturmgeschütz*, their relationship with the infantry is very good, although this steadily increased the requirements put on the *Sturmartillerie*. Sadly, the *Abteilung* commanders are not fully understood. Combat operations and reconnaissance duties at night are expected and will not be stopped until the first vehicle is lost. The following statement by the commander of an infantry regiment shows a complete lack of understanding: "The loss of a *Sturmgeschütz* is irrelevant. It takes 18 years and nine months to make an infantryman: a *Sturmgeschütz* can be manufactured within a few weeks."

The *Sturmgeschütz* were often transferred suddenly from one sector to another. One *Abteilung* was subordinated under 11 different divisions within ten days; another was with four armies over a period of four weeks. A senior artillery officer referred to this commitment of the *Sturmartillerie* as "calling the fire brigade". Our losses resulted from mechanical failure caused by overuse rather than enemy fire.

The commitment of StuGAbt 189 to 78.*Sturmdivision* has worked well, apart from a few difficulties [This subordination lasted from January 1943 to July 1944 and was an exception, author]. The leaders of both units know each other, no unnecessary requirements were made, and supply was never a problem. An attached escort company selected from the infantry and pioneers proved praiseworthy.



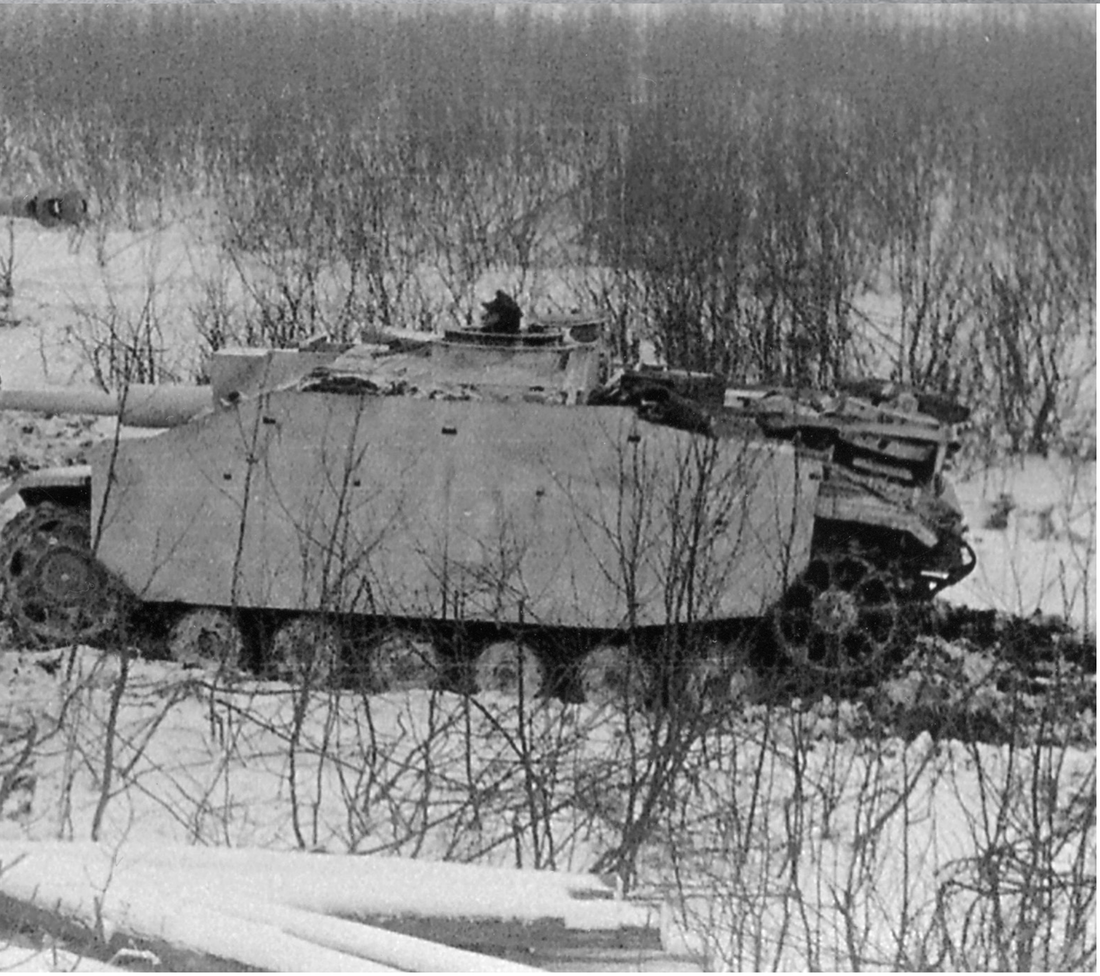
A group of grenadiers being transported on a *Sturmhaubitze* Ausf G near Kovel, (a town in the Volyn Oblast, northern Ukraine), during the winter of 1944. The *Panzerschürzen* has been modified by a workshop unit, which has replaced the susceptible rigid mountings with a flexible type. By 1944, this had become a standard modification. The *Sturmhaubitze* has received a factory-applied 'Zimmerit' coating. A *Maschinengewehr* (MG) 42 is protected by gun shield. (Anderson)

> Technical experiences:
> The *Sturmkanone* as well as the *Sturmhaubitze* are working effectively. The proportion of seven to three has turned out to be correct. The 7.5cm is sufficient against all present enemy tanks and the HL hollow-charge ammunition has proved to be effective. However, the crews prefer to use *Panzergranate* HE rounds when engaging a soft target. Now that the Russians have a tank equivalent to our Tiger, they suggest that the 8.8cm PaK should be installed.
>
> The 30W radio is powerful, we have reached ranges of up to 200km, and the intercom works well.
>
> The machine gun for the loader's position has not proved successful. We suggest it be installed in the driver's or gunner's position.
>
> The *Panzerschürzen* has proven to be effective against anti-tank rifles and light anti-tank guns, but the mounting brackets are too weak. Also, the armour protection for the commander's cupola is insufficient.
>
> Engine and suspension are too unreliable. In terms of automotive performance and cross-country mobility the *Sturmgeschütz* is still inferior to the Soviet T-34.

The commander of this replacement unit must have been a true Nazi, loyal to the party line. Any comment on his cynical assessments is unnecessary, as front-line officers and men had a different attitude, as the author has learned during conversations with veterans. *Oberstleutnant* Christ concludes his report with an impressive list of kills against losses:

StuGAbt	Total kills August 1943	Own total losses
912	21	0
226	10	2
184	27	0
190	17	0
185	87	4
189	76	0
270	62	2
600	18	1
904	55	7
191	7	1
210	43	1
Totals	**423**	**18**

These numbers are a testimony to the tactical skill of the men in the *Sturmartillerie*, when fighting a numerically superior enemy. Also, it must not be forgotten that both the T-34 medium and the KV-1 and KV-2 heavy tanks were in many ways technically superior to the *Sturmgeschütz*.



Two *Sturmgeschütz* Ausf G from an unidentified unit; both are fitted with undamaged *Panzerschürzen*. A PzKpfw VI Tiger Ausf E of sPzAbt 505 is parked in the background. (Anderson)

StuGAbt 177, although not visited by *Oberstleutnant* Christ, submitted an after-action report at end of August:

> I.) Re-establishment of the *Abteilung*:
> After the unit had been decimated during the fighting around Stalingrad, StuGAbt 177 was re-established, between 25 March and 13 April 1943, at Niemegk near Bad Belzig. During the re-establishment six officers, 26 NCOs and 91 other ranks of the former *Abteilung* joined the new unit.
>
> b. Ordnance:
> The *Abteilung* was supplied with 31 *Sturmgeschütz*: 22 *Langrohr* Ausf G and nine *Sturmhaubitze* 42.
>
> 2.) Combat experience:
> Additional armour
> During combat the cupolas on our vehicles were reinforced by welding on sloped pieces of 30mm armour (taken from immobilized *Sturmgeschütz*)… To reinforce the side armour of the casemate, track links were mounted above the track guards.

Sturmgeschütz: Questioning the Concept

7

Between 1942 and 1943, *Sturmartillerie* units had proven their combat value in numerous battles. Reports of the many successes were not only used – and somewhat embellished – by the German propaganda machine, but also by the *General der Artillerie*. His aim was to extend his influence and promote the importance of his force to ensure an increase in the supply of men and scarce equipment above all other branches, including the *Panzertruppe*.

In January 1944, the *General der Artillerie* published a notice declaring a growing in importance:

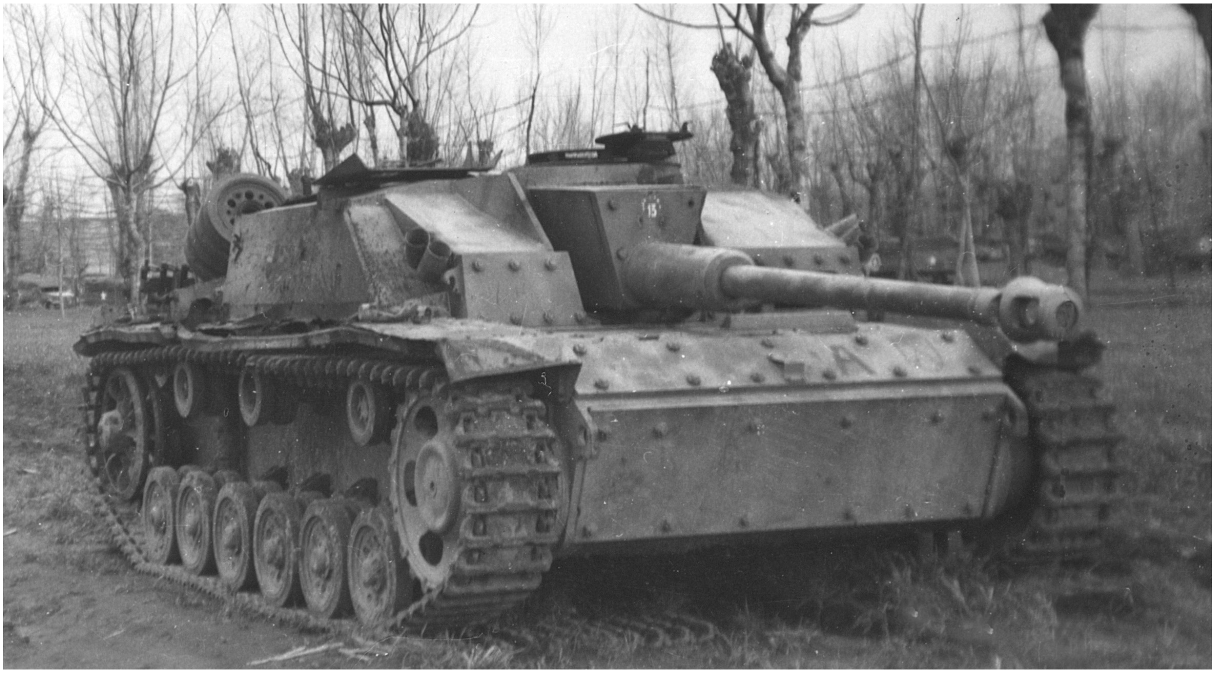
> Today, technology has had a decisive influence on the artillery by providing armour protection and better mobility. The modern artillery can be divided into:
>
> 1.) Towed artillery (horse-drawn and mechanized)
> 2.) Self-propelled armoured artillery
>
> The second group is now designated the '*Panzerartillerie*', combining all motorized artillery guns under armour protection… The future of the (artillery) force is in its further development… The previously achieved success of the *Sturmartillerie*, so far 13,000 destroyed tanks, clearly shows how far the might of the artillery has grown.

This *Sturmgeschütz* Ausf G has been coated with 'Zimmerit' and is fitted with *Panzerschürzen* (tank side skirts), first introduced during 1943. It is also fitted with a new type of gun mantlet, called *Saukopf* (pig's head) by the crews, which had a better shape to deflect anti-tank fire. (Getty)

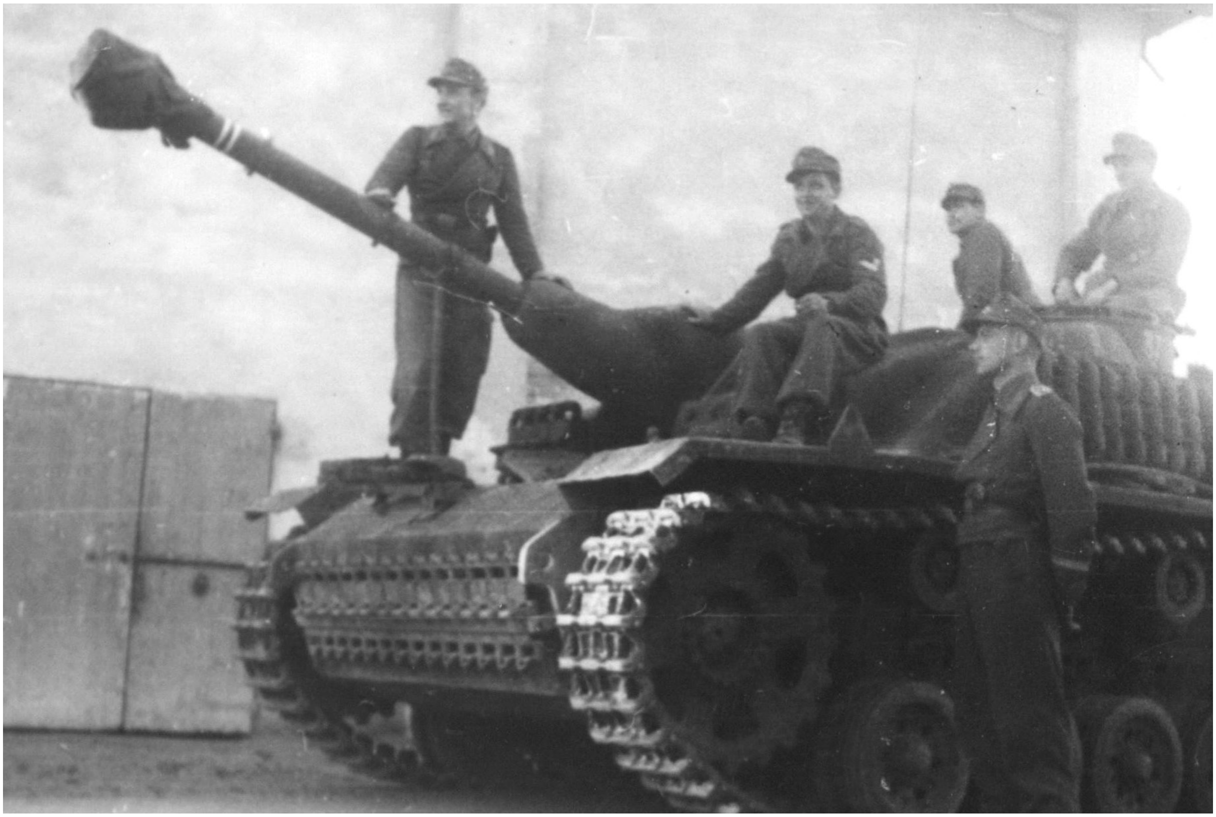
On 26 June 1944 – Allied forces had already established a bridgehead in France after the success of Operation *Overlord* – Guderian wrote a report dealing with the efforts to halt PzKpfw IV production in favour of the *Sturmgeschütz*. At that time, officials of the *Heereswaffenamt*, seconded to the *General der Artillerie*, claimed that by concentrating on the production of a turretless tank, large amounts of precious raw materials would be saved. They also noted that the improved armament and armour protection on the '*Neue Sturmgeschütz*' could result in increased numbers of highly effective fighting vehicles being available to front-line forces. However, Guderian saw the substitution of the PzKpfw IV by the *Sturmgeschütz* in the *Panzerregiment* as serious disadvantage:

> Memorandum on the *Führervortrag* dated 26 June 1944.
> Changeover of PzKpfw IV to StuG L/48 resp. L/70
>
> I.) Tactical and technical matters.
>
> The 7.5cm KwK L/48 firing PzGr 39 is sufficient to fight all known British, American and Russian tanks at combat ranges from 600 to 1,200m, including the British 'Cromwell' tank.
>
> After-action reports dealing with the deployment of PzKpfw IV in comparison to the *Sturmgeschütz*, imply that the latter, when operating in mountain areas or on coastal roads in Italy or in the narrow, deep, hedge-lined lanes [bocage] of Normandy, is tactically inferior to the PzKpfw IV. Firing to the side is possible but is very limited, since the terrain does not allow the vehicle to turn on to the target… Furthermore, the low position of the gun impedes firing over hedges.

This memorandum confirms that efforts were being made to substitute parts of the tank production by delivering greater numbers of (cheaper to build) *Sturmgeschütz*. A similar discussion had taken place a year earlier, when some officials suggested to totally stop PzKpfw IV production in favour of the much more powerful PzKpfw V Panther. Guderian, the *Generalinspekteur der Panzertruppe*, would finally block both ventures with good reason. A cessation



A *Sturmgeschütz* Ausf G of StuGBrig 242, in Italy. (The *Panzerschürzen* and mounting brackets have been removed, possibly to allow travel along the narrow lanes and dense scrubland.) The unit's distinctive badge, two crossed swords, is just visible on the front slope of the superstructure. The black-painted 'A' is the vehicle's individual letter, but the reason for the small number '13' on the mantlet is a mystery. (PeKo)



Two 'kill' rings have been painted on the gun barrel of this *Sturmgeschutz* Ausf G of StuGBrig 242. The vehicle is fitted with a cast *Saukopflende* (pig's head mantlet), and lengths of track have been fitted to the side armour of the superstructure. (Anderson)

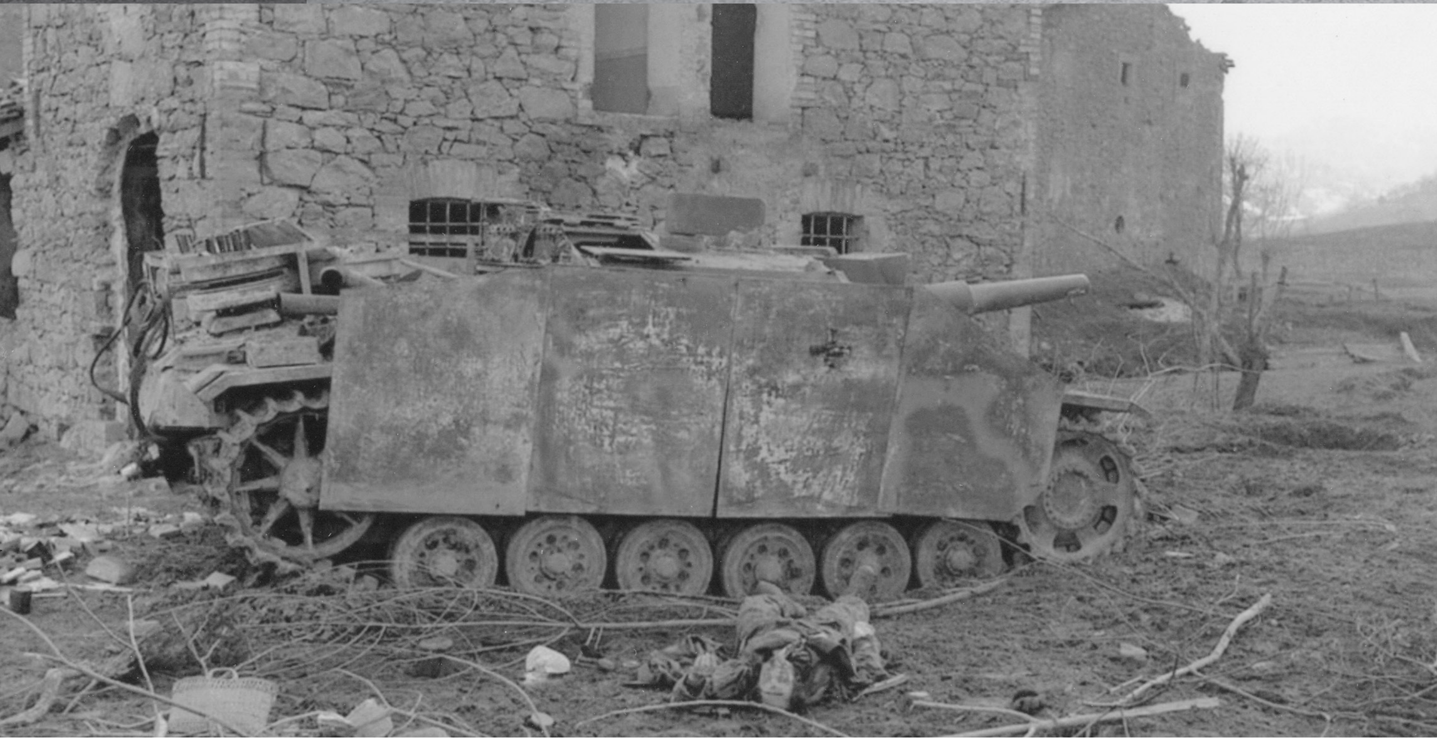
of PzKpfw IV production would have put the fate of the *Panzertruppe* at risk; a switch to the PzKpfw V Panther would have taken precious time, dangerously reducing the number of tanks available. Furthermore, having in mind the very specific tactical tasks the *Sturmgeschütz* was 'tailored' for; it should have been obvious that a tank could, to a great extent, be a substitute for an assault gun.

A New Front in Italy

In May 1943, after the loss of Tunisia, German troops retreated to Sicily. The Allies now began to elaborate a plan for what Stalin had been demanding for a long time – a second front in Europe: The most obvious target being Italy.

On 10 July 1943, British and US forces landed on the southern shores of Sicily, and during the following month German forces were driven into the north of the island. By the end of 1943, Allied forces had landed on mainland Italy and advanced to the south of Rome. Here German forces had established defensive positions: the Gustav Line.

Oberkommando Süd (Supreme Command South) reported 196 operational *Sturmgeschütz*. At that time there was, however, only one *Sturmartillerie* unit available, StuGAbt 242 with 2.*Batterie* and 3.*Batterie*, its 1.*Batterie* having been lost in Tunisia. In August, the unit received a third battery equipped with nine *Sturmhaubitze*, reaching the target of 31 *Sturmgeschütz* according to the valid



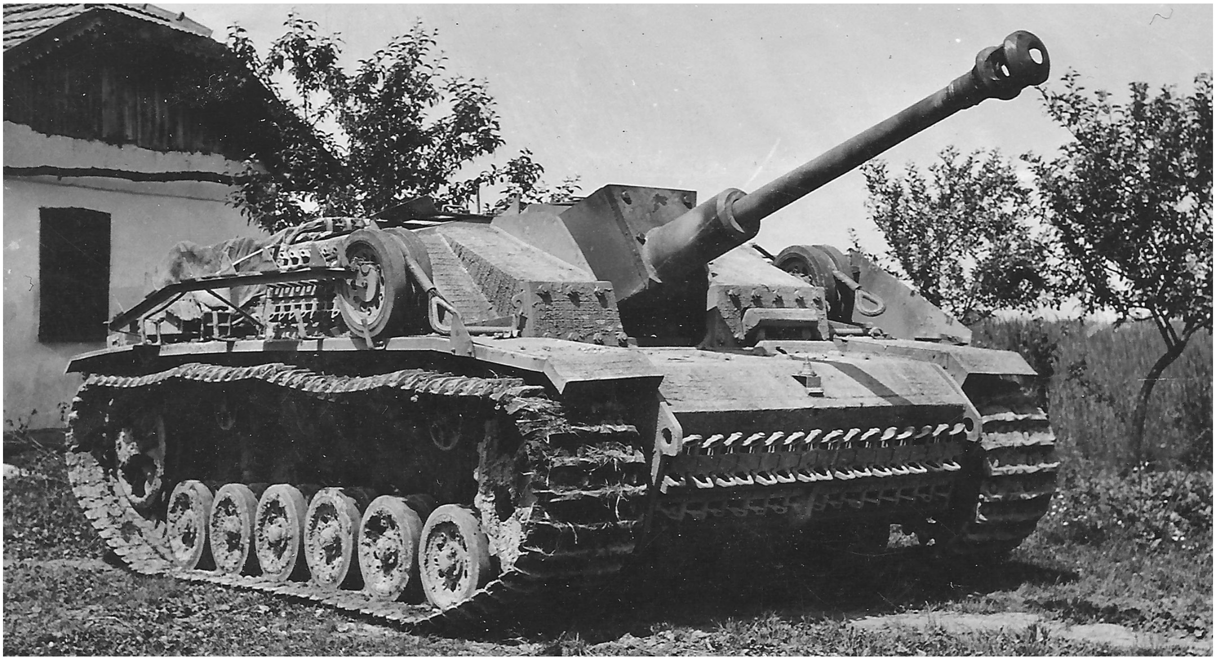
This *Sturmhaubitze* 42 in service with StuGBrig 907 or 914, was abandoned after a battle in northern Italy during the early months of 1945. A muzzle brake is not fitted, but it does have *Panzerschürzen* which indicates that it was produced after September 1944. A *Rundumfeuer-Maschinengewehr* (all-round firing machine gun) has been fitted; the weapon was operated from inside the vehicle. (NARA)

KStN 446. At the end of 1943, the unit reached the area around Rome without being involved in any combat operations. In January 1944, StuGAbt 242 was moved into the Gustav Line.

In the same month, StuGAbt 907 was to be established near Rome, where the unit also received ex-Italian Army soft-skinned vehicles. Initially, StuGAbt 907 was also issued with 31 Italian-built assault guns. This order was changed, and subsequently the unit received *Sturmgeschütz* from other German army units fighting in Italy and by February, 14 *Sturmgeschütz* had been delivered. The planned delivery of *Sturmgeschütz* from *Panzerregiment* Hermann Göring did not take place due to an intervention by *Reichsmarschall* Göring. Finally, 14 *Sturmgeschütz* were delivered by PzAbt 129. According to official documents, these *Sturmgeschütz* were in a desperate state and non-operational. Short-term repair was not possible due to the lack of workshop capacity and the shortage of spare parts. Thus StuGAbt 907 as part of 721.Infanterie Division entered combat with only 14 *Sturmgeschütz*.

In January 1944, StuGAbt 914 was established and four weeks later the unit was transported to Italy. The authorized 31 *Sturmgeschütz* and the other equipment were to be delivered by *Heeresgruppe* C. Eventually, the unit received ex-Italian Semovente M13/40, armed with a short-barrelled L/25 gun, which were designated '*Sturmgeschütz* M 43'. In April 1944, an order was given to replace the L/25 by an Italian-built L/46 gun to improve firepower.

The first combat took place northeast of Rome. According to the war diary of the *General der Artillerie*, the unit reported mechanical problems with the Italian vehicles, which had led to a great number of losses. In autumn 1944, StugAbt 914 was transferred to northern Italy where it was re-equipped with 22 *Sturmgeschütz* and nine *Sturmhaubitze* delivered new from Germany.



During the winter of 1943/44, *Ostketten* (east tracks) were introduced, which gave much improved cross-country performance and a longer service life. Note, this *Sturmgeschütz* Ausf G has the more rugged type of attachment brackets for the *Panzerschürzen* which had been introduced on many late-production vehicles. (Anderson)

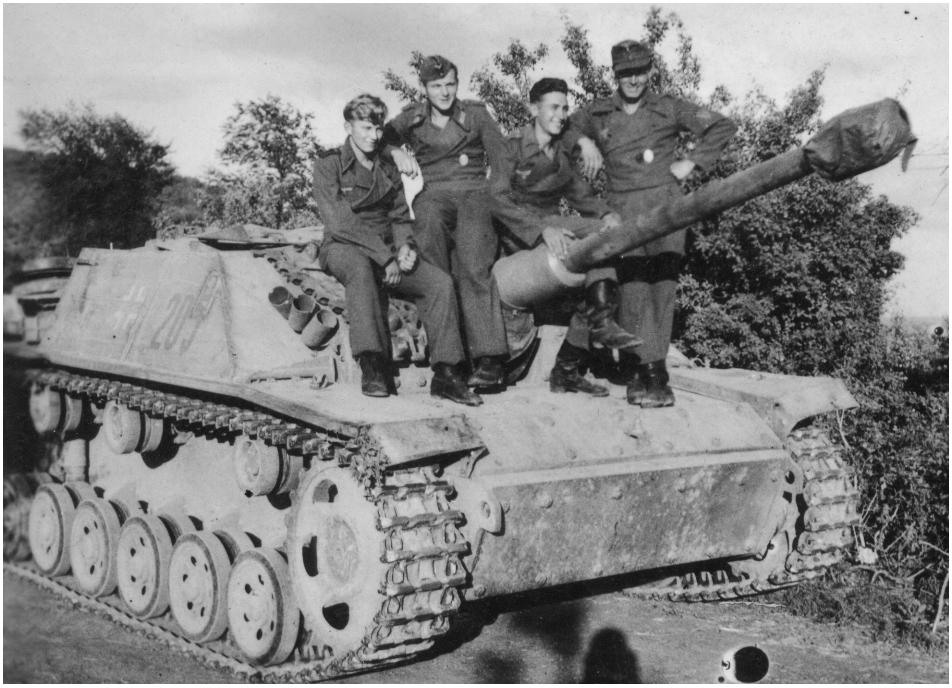
The mountain areas of Italy, which were traversed by many narrow roads, were to cause serious problems for the *Sturmgeschütz*. Locking on to a target over a hedge or a stone wall was impossible. Indeed, the crew of a *Sturmgeschütz* always had to turn their vehicle in order to engage targets. All components in the drive train became dangerously over-stressed which resulted in numerous breakdowns which, in turn, blocked the narrow roads, impeding access for recovery and pioneers units.

With these problems in mind, the many reservations uttered by Guderian now became understandable, and backed by reality.

The Quest for a Better *Sturmgeschütz*

The appearance of the T-34 was a shock for the German military. For the *Sturmartillerie* this wake-up call resulted in hastily initiated up-armouring and up-gunning programmes. The introduction of the *Langrohr-Geschütze* in 1942, considerably improved the combat value of the *Sturmgeschütz*. However, by this time the development of new, far superior combat vehicles had also commenced, resulting in the PzKpfw VI Tiger followed by the PzKpfw V Panther.

The introduction of ever heavier armour and weapons to combat the Soviets raised the expectations of the *Führer*, and also the authority of the *General der Artillerie*. This ambition to develop *schwere Waffen* (heavy weapons) was to be broadened to all branches, including the *Sturmartillerie*. In 1943, the first *schwere Sturmgeschütz* were delivered to the battlefront. Originally known as the Ferdinand (later *Elefant*), the type proved to be tactically useless and all were subsequently delivered to the *Panzerjägertruppe*.



A *Sturmgeschütz* Ausf G of StuGBrig 191. The crews of this unit considerably modified their vehicles. The original *Panzerschürzen* has been removed and used as extra armour on the superstructure, the gap between which and the side plate has been filled with concrete. Note the vehicle is equipped with smoke dischargers, but these were removed after a short time in service. (Anderson)

During a conference with the *Führer* on 9 September 1942, the following benchmarks for a new assault gun, the '*Neue Sturmgeschütz*', were discussed:

10.) These are the minimum requirements for the "*Neue Sturmgeschütz*":

Frontal armour	100mm
Side armour, minimum	40 to 50mm
Ground clearance	50cm
Speed, maximum	25kph
Ordnance	7.5cm StuK 42 L/70

Very low firing height
The weight can be increased to 26t without any objection.

Two weeks later, these requirements were clarified:

1.) The *Führer* welcomes the proposal to introduce a leaf-spring suspension resulting in a greater ground clearance of 50cm as a transitional measure. Furthermore wider tracks will reduce the ground pressure from 1.0 to 0.7.

2.) Since these improvements will not be introduced before May [1943], it shall be examined immediately as to whether any remaining targets can be fulfilled by this time and giving priority to the following improvements:

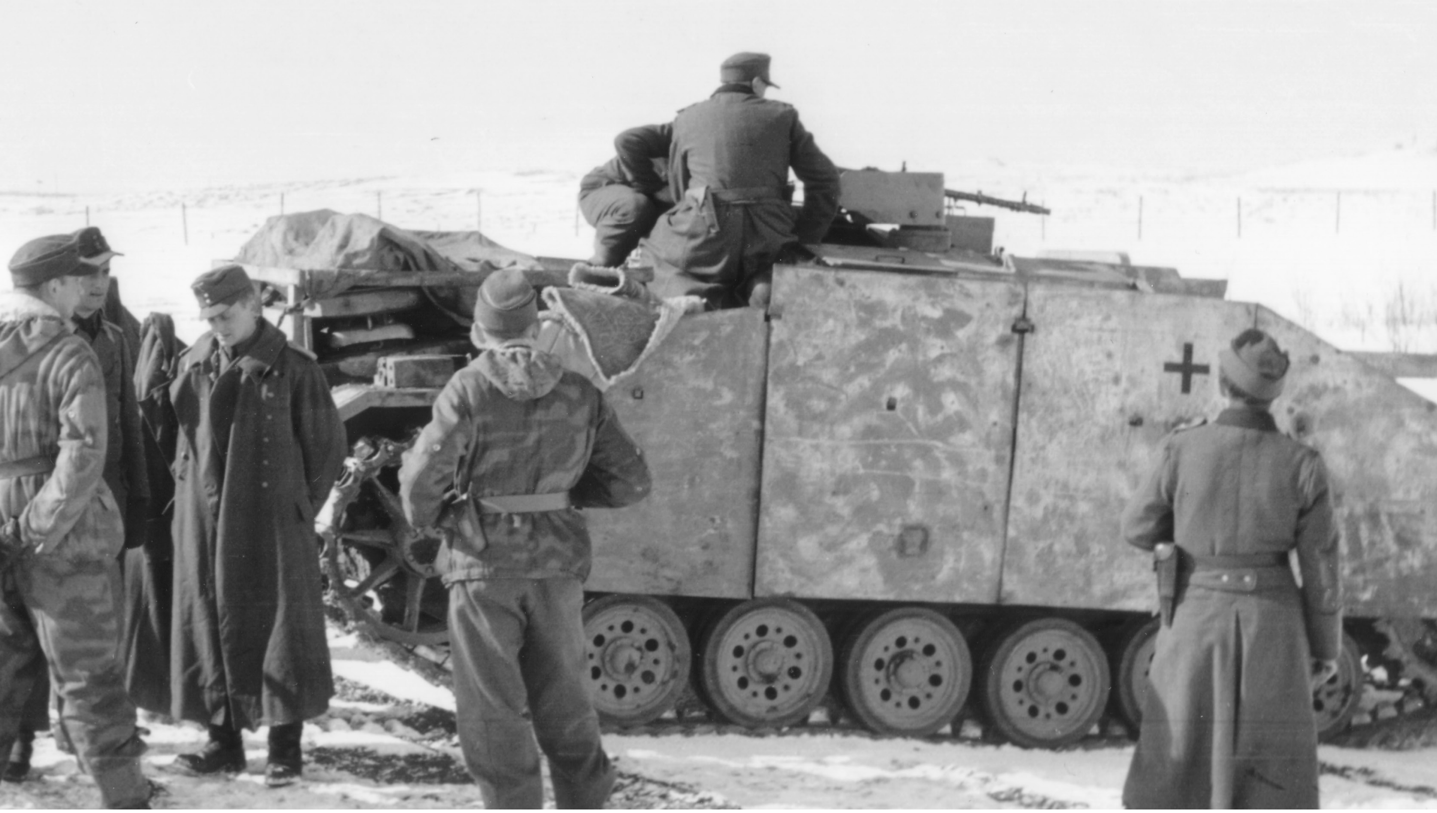
7.5cm L/70, reinforcing the frontal sloped armour plate to 100mm…

> For an accelerated transition it would be sensible to use the PzKpfw IV hull and the engine and gearbox installation, since these are proven. The *Führer* again emphasizes that a reduction in speed is of minor importance.
>
> 3.) If a complete redesign should be necessary to obtain the "*Neue Sturmgeschütz*", it shall be immediately checked as to whether a long 8.8cm KwK can be installed.

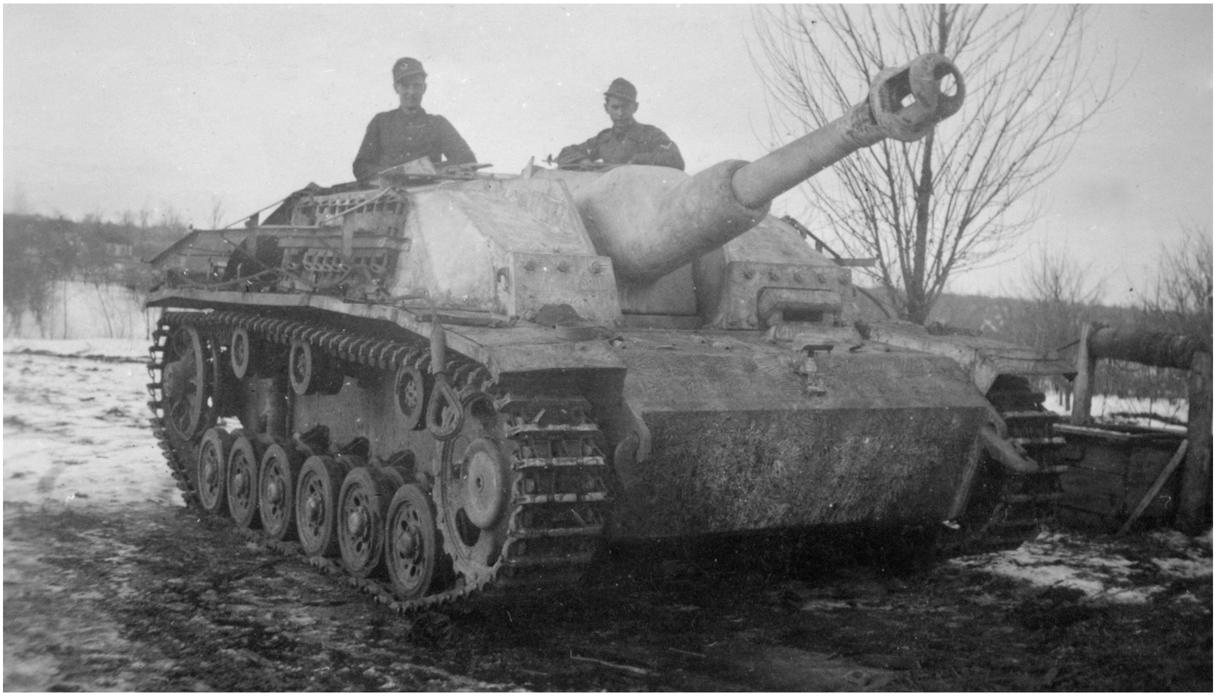
Most certainly these demands delighted many influential senior officers in the military and those in the armaments industry. By 1943, the *Sturmgeschütz* mounting the long-barrelled gun had achieved a perceived superiority over modern Russian tanks (usually by far better combat tactics), the prospects of getting an ultimate weapon the 'ultimate *Sturmgeschütz*' was an exciting prospect. The *General der Artillerie* was confident, as he noted in his war diary.

By mid-1943, the *Sturmartillerie-Schule* Jüterbog published a questionnaire dealing with the further development of the *Sturmgeschütz-Waffe*. One reaction from a front-line unit is still preserved in the archives: StuGAbt 244 submitted the following ideas:

> It is of utmost importance to produce a *Sturmgeschütz* mounting a gun which is equal to the 8.8cm gun of the Tiger. Fighting during the retreat, our



During the winter of 1943/44 StuGAbt 189 was selected to test the new *Rundumfeuer-Maschinengewehr* (all-round firing machine gun). This versatile weapon was operated from the safety of the interior of the *Sturmgeschütz*. (Anderson)



A *Sturmhaubitze* in the spring of 1944, fitted with a *Saukopfblende* (pig's head mantlet), sometimes referred to as a *Topfblende* (pot mantlet). Most probably, the vehicle was delivered with a factory-applied 'Zimmerit' anti-magnetic coating which has worn off during service on the battlefield. (Von Aufseß)

> *Sturmgeschütz* were primarily used as tank destroyers. The Russians tend to support their tank assaults with fire from heavy anti-tank guns. Their tanks then advance to the main line of resistance and open fire. It often proved impossible to attack them at an effective combat range – approximately 1,800m for the StuK 40 L/48 firing PzGr 39. On one such occasion, our *Abteilung* lost seven out of 12 *Sturmgeschütz*; two were total losses. In the future we must reject such missions… The 8.8cm KwK 36 L/56-armed Tiger, however, is able to destroy T-34 and KV-1 at ranges up to 3,000m.

However, there were diverging opinions. An entry in the war diary of the *General der Artillerie*, dated 4 February 1944, notes that the planned installation of the 7.5cm KwK 42 L/70 gun (as in the PzKpfw V Panther) in the *Sturmgeschütz* was discussed. It should be clear, that in this context the term *Sturmgeschütz* does not automatically refer to the existing assault gun built on the hull of the PzKpfw III:

> Lengthening the gun barrel on the *Sturmgeschütz* to improve the armour penetration.
>
> The installation of the L/70 ordnance replacing the StuK 40 L/48 in the *Sturmgeschütz* would result in:
>
> Disadvantages:
> 1.) Increase of the weight by 500kg. The limits of the engine performance would be reached. Cross-country mobility would be reduced.

> 2.) The barrel length of 5.25m will result in an overhang of 3.02m. Manoeuvrability in wooded and built up areas will be significantly reduced.
>
> 3.) The increased muzzle velocity will reduce the service life of the barrel to such an extent that the *Sturmgeschütz* will not be able to be used for further tasks.
>
> 4.) The significantly increased muzzle blast will create a cloud of thick dust which will seriously affect the commander's observation capabilities, resulting in a reduction in the rate of fire.
>
> Advantages:
> The increase in amour penetration is a great advantage.

StuK 40 L/48	Range (m)	100	500	1,000	1,500	2,000
7.5cm PzGr 39	Thickness (mm)	99	91	82	72	63

KwK L/70	Range (m)	100	500	1,000	1,500	2,000
7.5cm PzGr 39/42	Thickness (mm)	138	124	101	99	88

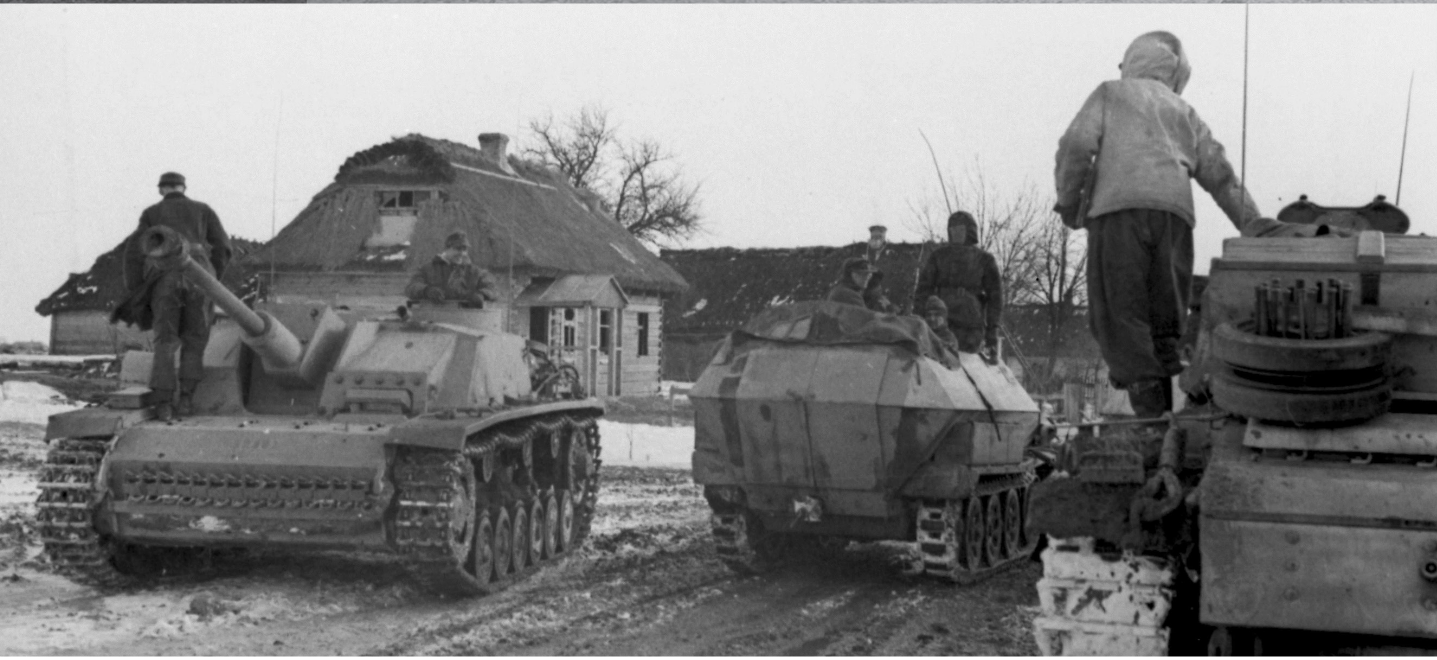
> Summary:
> The better penetration performance will be achieved but has to be offset against the above-mentioned significant disadvantages. The *Sturmgeschütz* will be labelled as a dedicated tank destroyer and not be seen as a support weapon for the infantry.

This line of discussion, although not entirely convincing, unveiled problems for the range of duties expected of the *Sturmgeschütz*, when used by *Sturmartillerie* units within infantry formations. The mounting of the 7.5cm KwK 42 L/70 high-performance gun would have finally changed the *Sturmgeschütz* to a tank destroyer. However, it must be remembered that by installing the more powerful gun, the greater muzzle velocity would result in the recoil being longer, which in turn would require a lengthened chassis: the result being a heavier vehicle.

The wish to receive new weapons led to misinterpretations, and even false statements. The war diary of the *General der Artillerie* includes a report on newly encountered enemy weapons. It was submitted by *Oberleutnant* Nöllenberg, the commander of 3./StuGAbt 243, on 16 February 1944:

> The unit saw combat after the establishment of a bridgehead at Nikopol. On 26 November 1943, enemy heavy tanks were encountered for the first time:

KV-14 [SU-152]:	Improved chassis of the old KV-1 Frontal armour: 140mm Weight: 46t Ordnance: 15.2cm howitzer, range of traverse considerably greater than the *Sturmgeschütz*.



This *Sturmgeschütz* does not have a coating of 'Zimmerit', which indicates that it was manufactured before August 1943. Although the *Panzerschürzen* have been removed, the attachment brackets have been left in place on the vehicle. (PeKo)

> The vehicle was superior to our *Sturmgeschütz* Ausf G in the direct duel. It can open accurate fire at ranges of 3,000m. We observed 15 hits to its front and side armour without effect.
>
> KV-85: Improved chassis of the old KV-1
> Frontal armour: 140mm
> Weight: 46t
> Ordnance: 85mm D-5T long
>
> The vehicle was superior to our *Sturmgeschütz* Ausf G in the direct duel. Several hits were observed on the front and side on ranges of 400 to 2,000m but did not penetrate (PzGr 39 and PzGr 40).
>
> The available speed of both Soviet vehicles over heavy terrain was 30kph: our *Sturmgeschütz* were forced to move in first (low) gear. They simply left the vehicle behind. We could only attack at ranges beyond 2,000m, hitting the top armour due to a curved trajectory.

The tanks encountered were the KV-85 and the SU-152. After the invasion of 1941, the Soviet Union fought and worked hard to survive, with all available manpower being used to increase production of munitions and weapons, the T-34 in particular. Between 1941 and 1942, no resources were available to develop new types or even make simple improvements other than production modifications. However, in 1943 the situation began to steadily improve.

Heavier weapons were introduced first. The 30mm 122-M howitzer was installed on a T-34 chassis (SU-122), and the massive 152mm ML-20 howitzer on the chassis of the KV heavy tank (SU-152). Both the SU-122 and later the SU-152 were built with fixed casemates in place of a turret, copying the German concept of the assault gun.

By mid-1943, Russian engineers succeeded in installing an 85mm D-5T high-velocity gun in an enlarged cast turret, resulting in the KV-85.

All these tanks were designed in a direct response to the PzKpfw VI Tiger and the PzKpfw V Panther, by applying the simple rule of introducing more powerful guns to defeat heavy enemy armour.

However, the information regarding the armour and mobility were, deliberately or not, exaggerated in the after-action report. Reliable Russian sources state that the frontal armour of the KV-85 hull was 100mm (maximum), while the cast turret was 100mm thick all around. The armour of the SU-152 was 60mm thick all around. However, the introduction of these tanks showed that Soviet Union was able to react to battlefield requirements. On the German side, both vehicles were defined as 'tanks difficult to combat'. For the *Sturmgeschütz*, mounting the 7.5cm StuK L/48, it proved to be most difficult to defeat these tanks at combat ranges over 1,000m; particularly if the shell did not hit at an angle of less than 90°.

Sturmgeschütz IV: an Assault Gun for the *Panzerjäger*

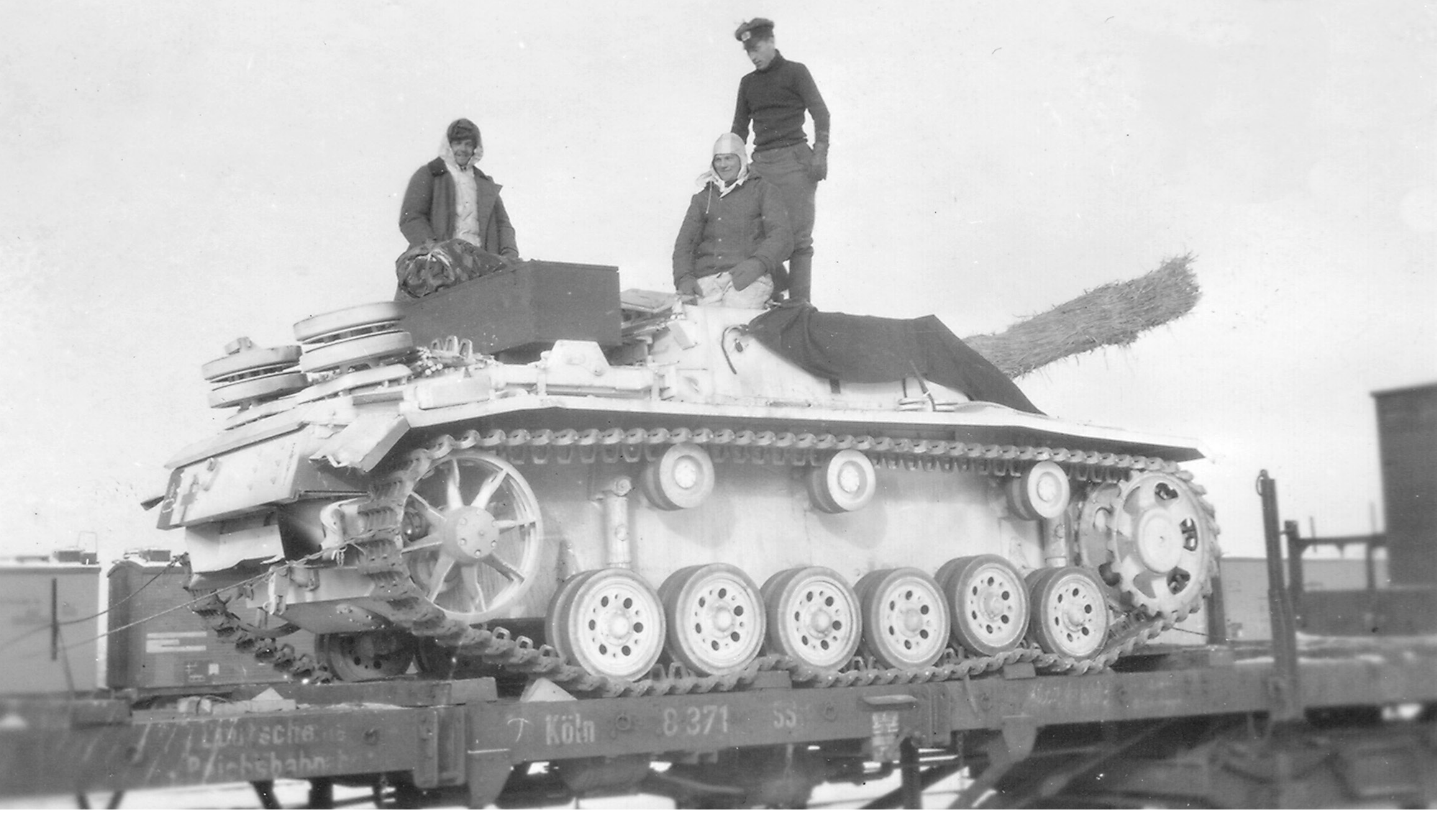
Between 23 and 26 November 1943, attacks by Allied bombers on the Alkett factory in Berlin-Tegel almost halted production. In October, a total of 270 *Sturmgeschütz* had been produced, but only 98 were completed in November. At this time production of *Sturmgeschütz* was regarded as a war priority, and equally important to the PzKpfw IV. In this situation, the lost production capacity was to be recovered at all costs. The decision was taken to modify the StuG superstructure to enable it to be mounted on the PzKpfw IV chassis. Alkett completed design and development in very short time and by early December 1943, Krupp-Gruson Werk in Magdeburg delivered the first *Sturmgeschütz* IV. The new assault gun was called StuG IV, making it necessary to rename the earlier *Sturmgeschütz* as the StuG III.

The complete production of the StuG IV, more than 1,000 vehicles, was to be issued to *Panzerjäger* (tank hunter) units of infantry divisions and similar units.

The '*Neue Sturmgeschütz*'

During the project stage of designing an improved assault gun it was decided to use the chassis of the PzKpfw IV, as being slightly larger it offered more internal space. Furthermore, it was considered to be more resilient. The design specification included suggestions to eliminate a number of the most obvious shortcomings with the *Sturmgeschütz*:

- Improvement of front, rear and side armour protection.
- Elimination of the many bullet traps in the superstructure and commander's turret (cupola).
- Reinforcment of the roof armour.
- Introduction of a close-defence weapon.



StuGAbt 325 was established in November 1943, but in April 1944 the unit was sent to Jassy, Romania where it was renamed StuGBrig 325. A *Sturmgeschütz* Ausf G from the unit is ready to be transported by rail to the east. The unit's badge, a sword, is just visible on the rear plate. The crew has attempted to camouflage the StuK 40 *lang* with straw. (Von Aufseß)

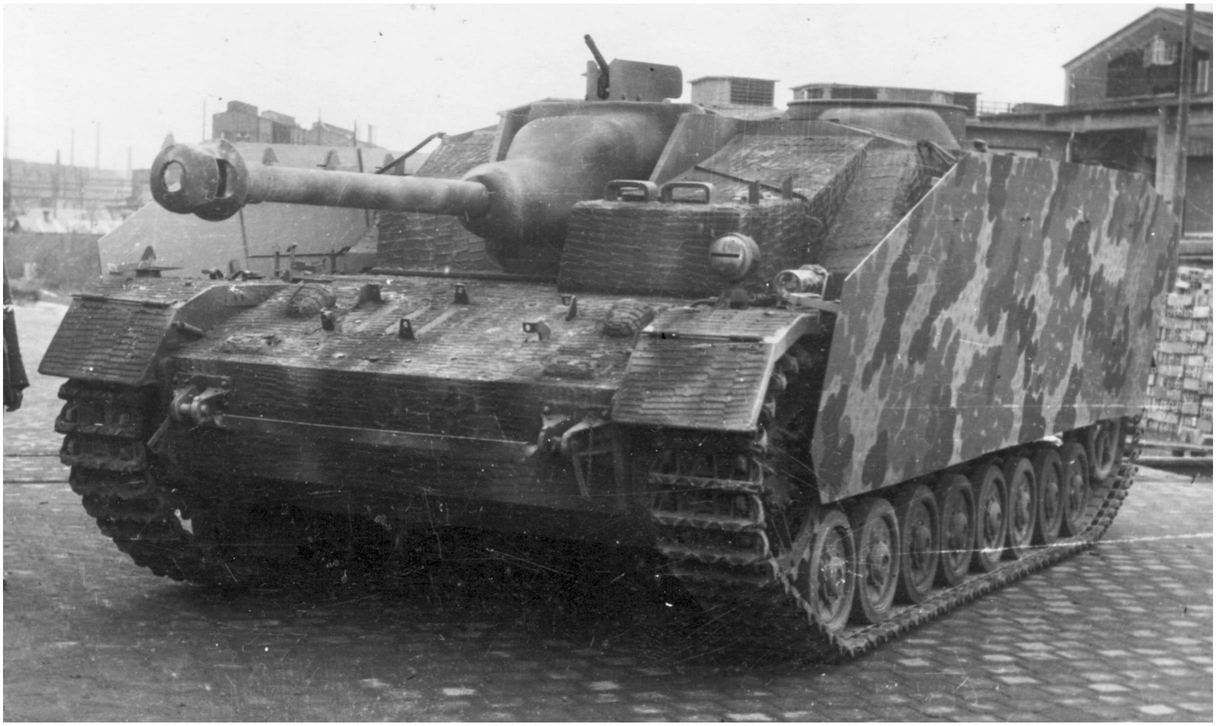
The new design had sloped, frontal armour 60mm thick (later increased to 80mm), and 40mm side armour. The roof of the casemate was increased to 20mm thick, a great improvement.

The vehicle was fitted with a 7.5cm PaK 39 on a ball-type mounting; the gun had an identical performance to the StuK 40.

Although the *General der Artillerie* aspired to get the new *Sturmgeschütz*, Guderian would prevail. He ordered to change the designation to *leichter Panzerjäge*r, and made sure that the vehicle was to be incorporated in the *Panzerjäger-Abteilungen* of *Infanterie*, *Gebirgs* and *Jägerdivisionen*. At that time, the fight for the limited resources had already begun. *Sturmgeschütz* were requested not only by the *Sturmartillerie*, but also by other branches of the army, including the *Panzertruppe*.

On 11 November 1943, *General der Panzertruppen* Guderian began assessing his requirements. He demanded 1,264 *Sturmgeschütz* to equip ten *Panzer-Grenadier-Divisionen* (PzGrenDiv), one *Panzer-Division* (PzDiv), seven *Heeres* (Army) and *Waffen*-SS *Panzerjäger-Abteilungen* (PzJgAbt), 11 *Heeres-Panzerjäger-Kompanien* (PzJgKp), and 14 *Luftwaffe* PzJgKp, and also eight *Funklenk* (radio-controlled demolition carrier units). With respect to the equipment already allotted, he determined a shortfall of 480 vehicles.

In the document he also mentions the requirements of the *Sturmartillerie*, which was to receive 200 *Sturmgeschütz* a month. During the planning period (October 1943 to April 1944) a total of 1,340 were delivered. His document also mentions a further 225 *leichte Panzerjäger* IV, the '*neue Sturmgeschütz*'.



From December 1943, the hull of the PzKpfw IV was also used to produce *Sturmgeschütz*. Designated *Sturmgeschütz* IV the new type was only issued to *Panzerjäger-Kompanien*. This production vehicle has received a 'Zimmerit' coating and is fitted with *Panzerschürzen* and also a *Rundumfeuer-Maschinengewehr* 34 (all-round firing machine gun). (Historyfacts)

The *General der Sturmartillerie* had to accept this, whether or not he agreed. However, in early 1944 it was clear that the *Sturmartillerie* would not be provided with the new assault gun: production of *Sturmgeschütz* and *Sturmhaubitze* would be continued.

A *Leichtes Sturmgeschütz*

In October 1944, the planning department of the *General der Artillerie* identified the PzKpfw 38(t) chassis as worthy of future development. The *Panzerjäger* 38 was designed to be the standard light tank destroyer for *Panzerjäger* companies within infantry divisions. A very compact vehicle was produced which had 60mm thick sloped armour and despite its relatively small size, room was found to fit a 7.5cm PaK 39 L/48 gun. This weapon, which had the same performance as the 7.5cm StuK, was to be mounted in the frontal armour plate and not on a space-consuming pedestal-type mounting. The *Panzerjäger* 38 was to be built in the same facilities once used for PzKpfw 38(t) tank and self-propelled gun production. The only *Sturmartillerie* unit to be issued solely with the *Jagdpanzer* 38 was StuGAbt 236 when it received 31 vehicles in early March 1945. Smaller numbers were delivered to some other brigades. During a conference on 25 October 1944, *Oberst* Schaede was presented some interesting details:

> Phasing out PzKpfw III and PzKpfw IV.
> 1)*Sturmgeschütz* production (PzKpfw IV *lang*) on the PzKpfw III/IV chassis will

Previous page: As most *Sturmgeschütz-Brigaden* were always lacking sufficient serviceable vehicles, the recovery of a damaged or immobilized *Sturmgeschütz* was most essential. Here an Ausf F/8 is being winched out of a marsh by a recovery team using an SdKfz 9 heavy halftrack, assisted by another *Sturmgeschütz*. (Getty)

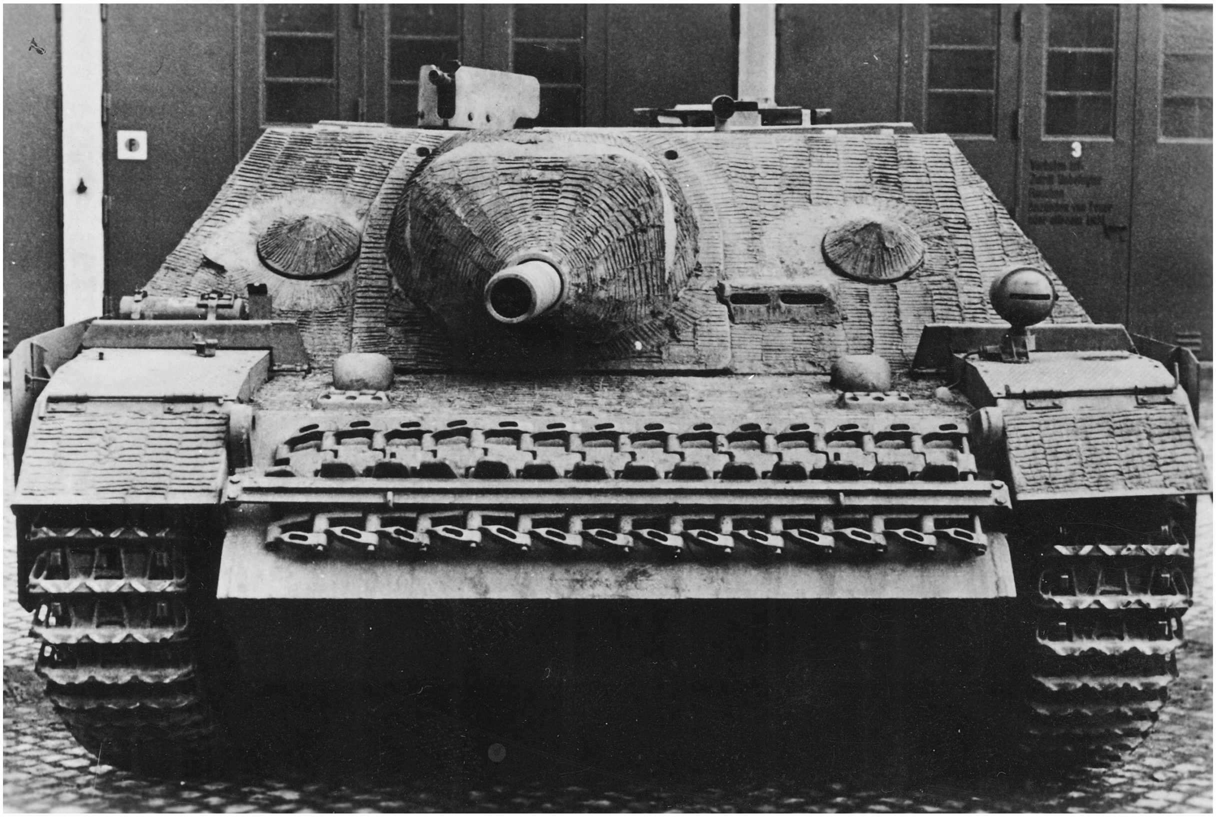
> continue until autumn 1945 due to problems with the changeover in production and to ensure a sufficient supply of spare parts.
> 3) The *Sturmgeschütz* '38t' (some 500 are in combat) has proved to be an outstanding success.
> 4) A *Sturmhaubitze* '38t' version is a serious possibility.
> 5) Mounting a *Sturmkanone* and *Sturmhaubitze* (without recoil) is also possible on the '38t'.
> 6) *Flakpanzer*.
>
> The *Sturmartillerie* is in urgent need of 300 *Flakpanzer*. The 3cm MK 103 'Kugelblitz auf 38t' has been developed and is in production. Technical problems continue with the 3cm *Zwilling* mounted on the chassis of a *Sturmgeschütz* III, and these will be checked by *Oberst* Schaede. For this purpose 30 chassis have to be supplied by the *Sturmartillerie*, and this is thought to be possible.

It is interesting to note that the introduction into service of the new light *Panzerjäger* 38 was pre-empted by the *Sturmartillerie*, which subsequently designated the type as the *leichte Sturmgeschütz*. The *General der Artillerie*, who noted in his war diary that the reworked *leichte Sturmgeschütz* was now called the *Jagdpanzer* 38 'd' (*deutsch* - German), expected delivery of the vehicles to begin by mid-May 1945. He also outlined his requirements for the *Jagdpanzer*, but demanded that the type should remain known as a *Sturmgeschütz*:

> The *leichte Jagdpanzer* [sic] must have the following requirements.
> 1.) A rotating commander's turret [cupola].
> 2.) A pivoted *Scherenfernrohr* telescopic sight.
> 3.) An *Entfernungsmesser* (rangefinder) similar to the type used on the Panther and Tiger tanks. [A stereoscopic type was under development, author.]
> 4.) A device to allocate targets.
> 5.) Good vision devices (optics) for the driver.
> 6.) Gunsight for the indirect weapon fire.
> 7.) Spaced armour at the front. [A mystery, possibly a steel skirt, author.]
> 8.) Co-axially mounted machine gun.
> 9.) Efficient remotely-controlled machine gun to provide all-round fire.

Once again, his demands were somewhat over ambitious. However, as with the *Panzer* IV (A), the *Jagdpanzer* 38 (also referred to as the *Hetzer* [Baiter]) was not issued to *Sturmartillerie* units on a regular basis. But a number of *Jagdpanzer* 38 were sent to the *Sturmartillerie* during the final desperate phases of the war.

StuGAbt 236 was the sole unit to be equipped only with the *Jagdpanzer* 38, having received 31 of the type in March 1945. After a month in action only four remained operational. On 5 April 1945, HStuArtBrig 905 reported having nine *Jagdpanzer* 38s operational and another undergoing light repair. A relatively large number were issued to *Sturmartillerie* units attached to *Heeresgruppe* Kurland. In April 1945, StuGBrig 202 had eight operational *Jagdpanzer* 38s,



The prototype of the *leichte Panzerjäger* (le PzJg IV), or *Jagdpanzer* IV, featured a superstructure fabricated from sloped armour plating. The vehicle is fitted with a *Rundumfeuer-Maschinengewehr* 34 and a *Sturmgeschütz*-type commander's cupola with seven vision ports; both of these features were not adopted for series production. (Historyfacts)

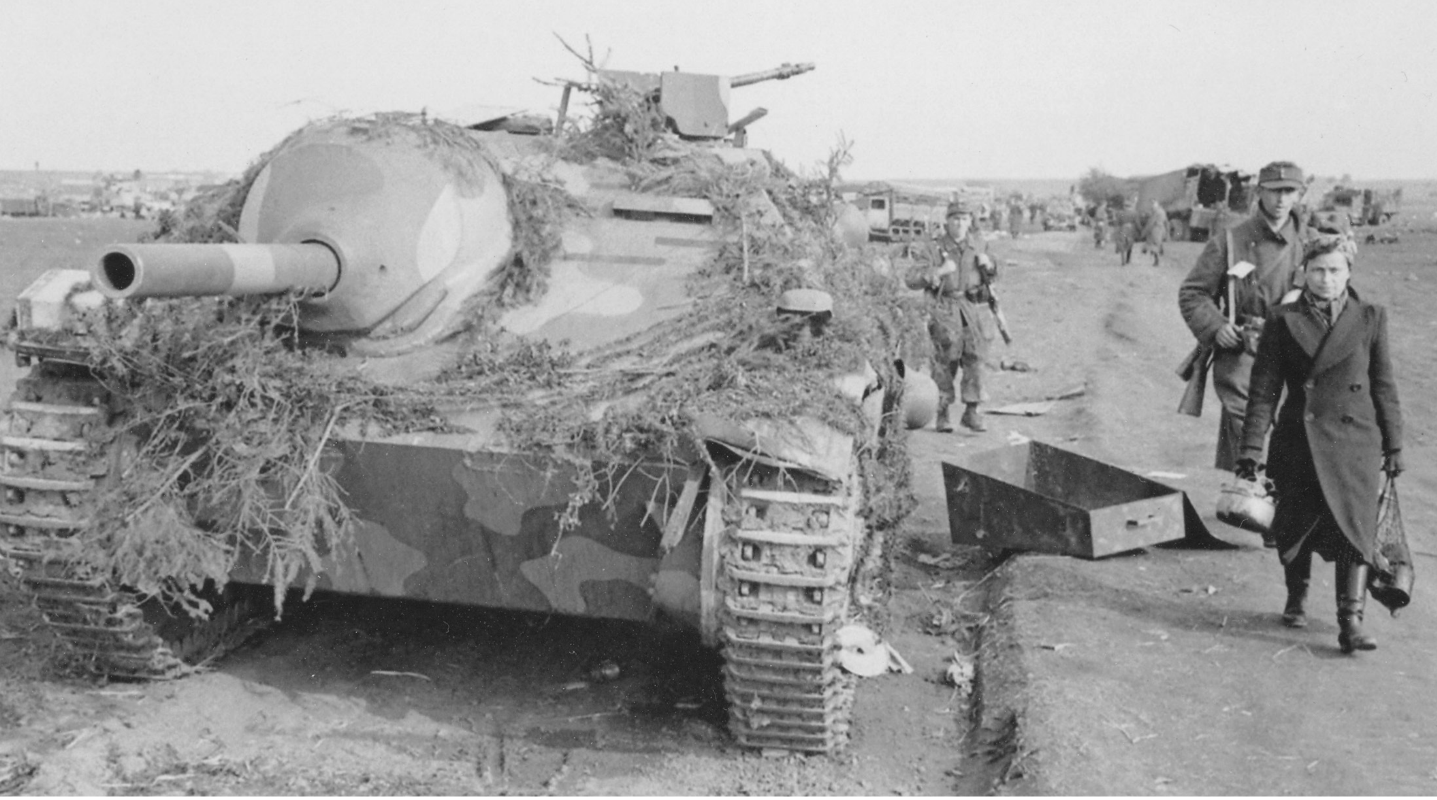
StuGBrig 393 had five, StuGBrig 600 just two and StuGBrig 912 had nine.

On 26 December 1944, the *General der Artillerie* reported on the planned allocation of Panzer IV *lang* to boost his forces:

> Increasing Firepower:
> The artillery demands that the 7.5cm StuK L/48 be replaced by the 7.5cm StuK L/70, beginning with one *Zug* for each *Sturmgeschütz-Brigade*. This platoon is to be used to attack the enemy's super-heavy tanks… General Thomale [Guderian's chief of staff, author] has agreed to the following allotment of Panzer IV *lang* (A – Alkett):
> December: 15
> January: 21
> February: 21
> A further 140 vehicles will be allocated.

A surprising number of *Sturmgeschütz-Brigaden* did receive the Pz IV (A):

StugBrig	341	244	394	902	905	911	280	236	301
	3	4	3	3	3	3	3	3	3
StugBrig	667	243	GD	300	311	210	190	276	111
	3	3	31	4	4	4	3	3	16



The *Jagdpanzer* 38, often called '*Hetzer*' (Baiter) by the troops, was a small and agile vehicle which had the same firepower as a *Sturmgeschütz*. The superstructure was fabricated from sloped armour plating, which gave protection against fire from infantry anti-tank rifles, but not against an enemy's latest anti-tank or tank guns. Most of the *Jagdpanzer* 38 built were issued to tank destroyer units. (NARA)

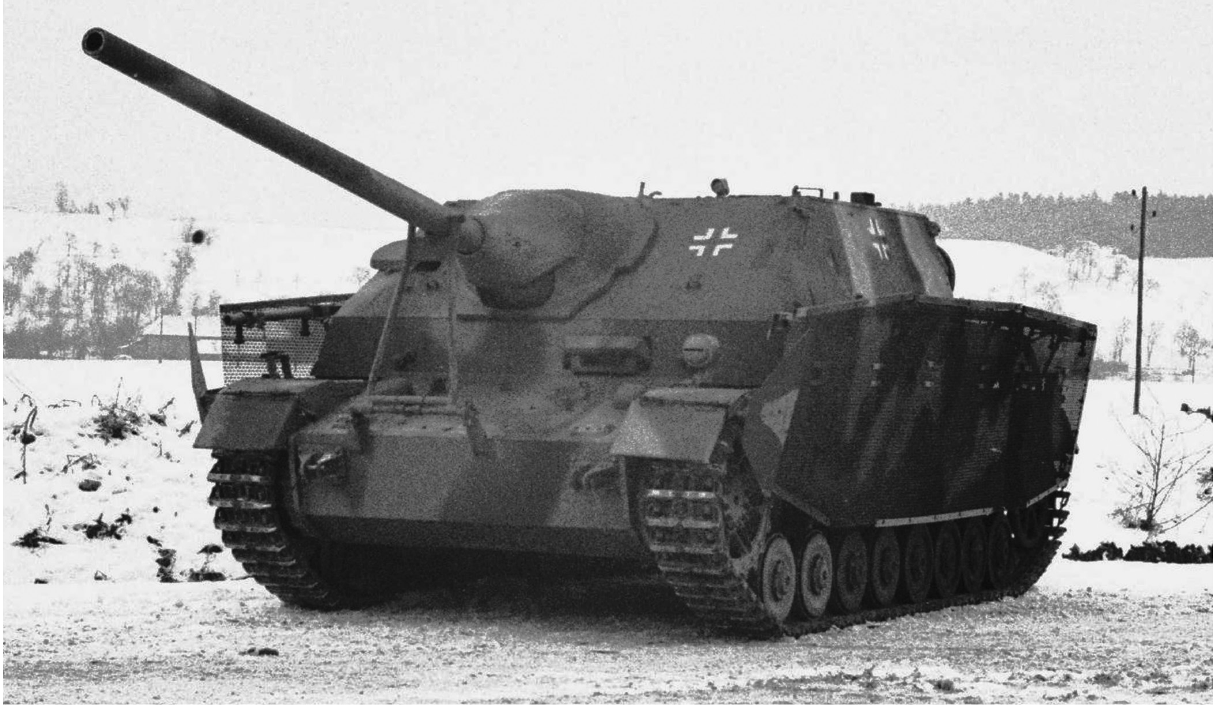
Improving Combat Capability

Sturmgeschütz were developed, introduced and intended as a direct support weapon for an infantry attack. This cooperation was welcomed by the infantry regiments, and worked well during the early phase of the war, where enemy forces often proved to insufficiently trained, badly equipped and poorly led.

However, after Operation *Barbarossa*, the invasion of Soviet Russia, the situation changed almost totally. After the failure of this *Blitzkrieg* attack, due to the mud and snow encountered in 1941, the war in Russia changed completely.

The *Sturmgeschütz* now became more and more dependent on liaison, cooperation and perfect coordination with the infantry. A detail from a report:

> A. The *Sturmgeschütz* is vulnerable to attack from the flanks and the rear. The Soviets have used all types of explosive anti-tank devices including 'Molotov Cocktails' to varying success. Most dangerous are anti-tank rifles which are available in very large numbers; this weapon is able to penetrate the thin armour of the side and rear plates. Also it can cause serious damage to the suspension and shatter vision devices (optics).
>
> B. The *Sturmgeschütz* is not fitted with any close-defence weapons (except submachine guns for use outside the vehicle) to effectively combat enemy infantry.



Some 100 *Panzer* IV *lang* (A), sometimes referred to as a *Zwischenlösung* (interim solution), were issued to *Sturmartillerie* units in early 1945. Although the 7.5cm StuK 42 L/70 was clearly superior to the StuK 40, the vehicle's mobility was significantly reduced. (Historyfacts)

In November 1942, a combat report submitted by 296.Infanterie Division states:

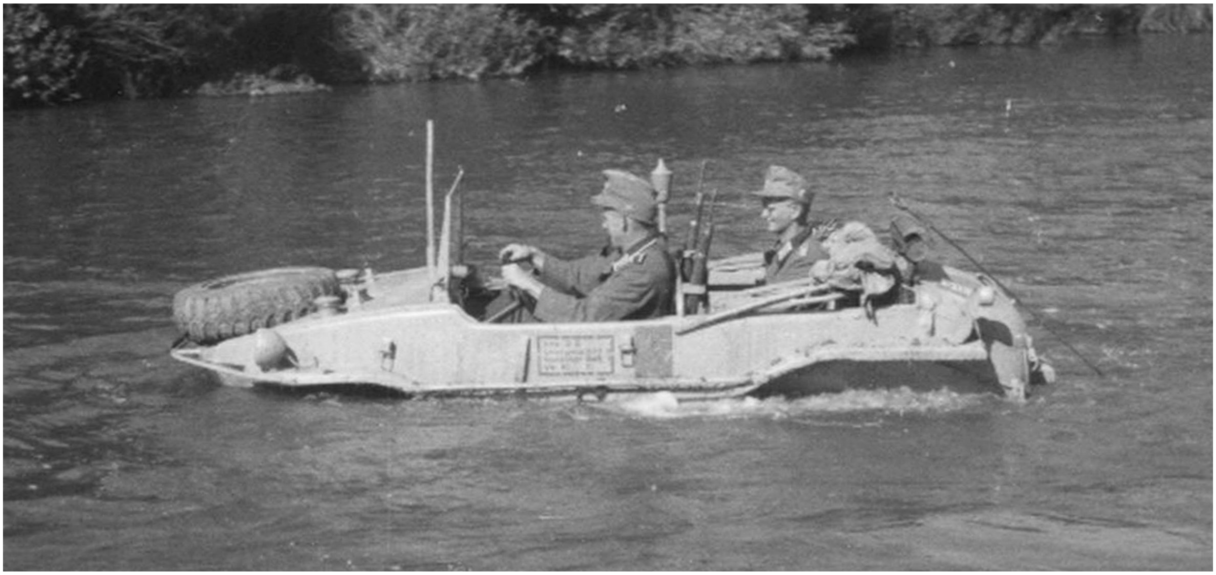
> The *Sturmgeschütz* is an attack weapon. In defence, it has to be used according to its tactical capabilities… In a battle, the infantryman has to cover the flanks and rear of the *Sturmgeschütz*. During combat in built-up areas the infantry has to neutralize all enemy fire from windows and rooftops.

The prospects of an infantry attack succeeding depended on the quality of the attached support weapons (*Sturmgeschütz* units). In turn, the *Sturmgeschütz* had to rely on the infantry for cover and protection.

In a note dated April 1944, the head of the training department summarized a conference at AOK 18:

> It is clear that our infantry will not face a poorly-trained enemy as in earlier times. The standard of training for our infantry has decreased considerably. For this reason *Sturmgeschütz* are most important, and in basic training recruits have to be fully trained to operate in close liaison with *Sturmgeschütz*.

The number of people criticizing the battle value of German infantry rose as the supply of equipment became worse. Also the number of older and more experienced soldiers, known as *Frontschweine* (front-line pigs), decreased dramatically. Replacement units sent to struggling front-line units were made up of ever younger men, who lacked morale due to a short period of



The small Volkswagen (VW) *Typ* 166 was a versatile and extremely mobile vehicle. Known as the '*Schwimmwagen*' (swimming vehicle), it was issued to many different units and used by the command echelons and also for reconnaissance duties. (Anderson)

training. Also the lack of sufficient equipment was a continuing problem. The combat value of the *Sturmgeschütz* units was at stake, and this would affect the attacking ability of the German infantry.

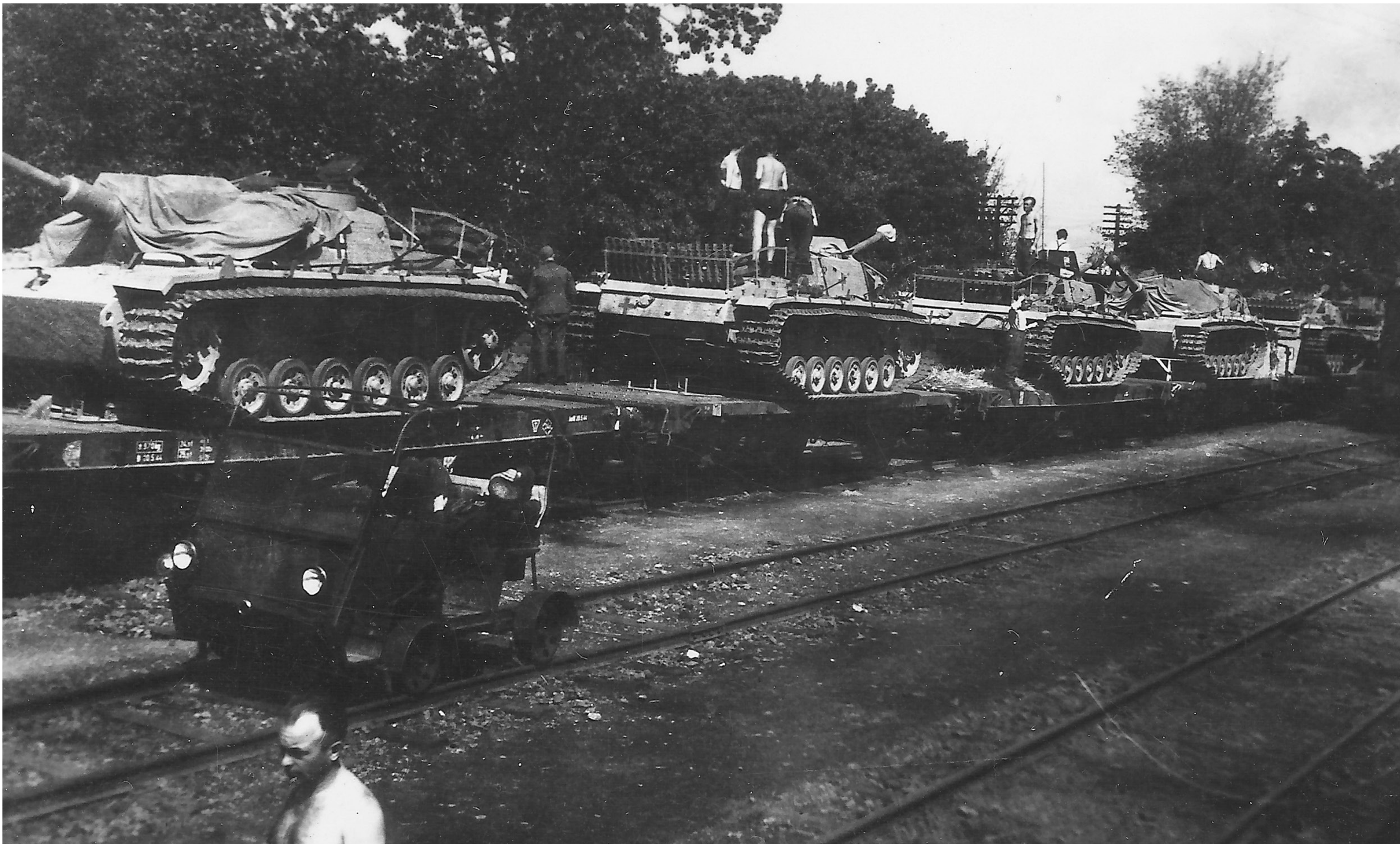
A first attempt to solve this grave problem was the distribution of information leaflets published by the *Sturmgeschütz-Lehrstab* at Burg on 11 November 1943. In parts the tone was reserved, possibly due to the modern Russian tanks which had arrived at the battlefront:

> What must the grenadier know about *Sturmgeschütz*.
> 1.) What can it achieve?
> *Sturmgeschütz* can be committed at the sharp end of the front line… With their optical equipment they can quickly recognize the enemy's heavy weapons. The *Sturmgeschütz* gun fires accurately and puts the enemy out of action within a short time. The *Sturmgeschütz* can fight against enemy tanks with great success, and is often superior.
>
> 2.) Which targets will the *Sturmgeschütz* fight?
> All targets beyond the range of the grenadier's weapons.
>
> 3.) How will it help the grenadier?
> The *Sturmgeschütz* will be committed in battery or at least platoon strength. They make best use of the terrain, moving from obstacle to obstacle to find firing positions. They open fire at ranges between 50 and 2,000m. The *Sturmgeschütz* will fight and neutralize the enemy´s heavy weapons. This is the moment the grenadier should wait for… Furthermore, the *Sturmgeschütz* can reliably send important messages by radio from the front line to higher echelons … In a desperate situation a *Sturmgeschütz* can be used to transport ammunition (even for heavy weapons) to the front line. A *Sturmgeschütz* can, when it is withdrawn to re-arm, be used to

> transport wounded to the first-aid station… In the pursuit, *Sturmgeschütz* can pick up grenadiers; each vehicle can carry up to a squad with its weapons.
>
> 4.) How can the grenadier help the *Sturmgeschütz*?
> Always attempt to keep close to the *Sturmgeschütz*. Help to identify targets; if the commander cannot hear due to his headset, climb on the *Sturmgeschütz* and shout instructions… When the *Sturmgeschütz* is committed far ahead of our own infantry, the grenadiers must give covering fire. A *Sturmgeschütz* is not a tank, its hatches will be open and it does not have a close-defence weapon, which makes it very vulnerable. It is your duty to keep enemy infantry away… It is the duty of a grenadier to warn the *Sturmgeschütz* commander if anything suspicious is detected; such as anti-tank guns and rifles, mines, tank traps and even swampy areas.

In order to increase the fighting power of a *Sturmgeschütz-Abteilungen*, a series of measures was introduced at all levels. The simplest way to overcome the perceived weakness of the infantry was to significantly improve contact with command echelons. Ideally, the senior *Sturmartillerie* officer would keep in close contact with the infantry leader to inform him prior to any action.

However, this was often complicated by the fact that *Sturmgeschütz-Batterien* or *Zugs* were often deployed over a wide area far away from the main unit. On many occasions, a lone *Sturmgeschütz* was called on to perform an impossible mission which, inevitably, resulted in the loss of the vehicle and fatalities amongst the crew.



Vehicles from StuGBrig 189 being loaded onto railway wagons for transport to the east; at the time the unit was subordinated to 78.StuDiv. Although it is summer, all *Sturmgeschütz* have been fitted with *Ostketten* (east tracks). These were usually issued in autumn, but have been fitted in anticipation of the mud caused by late-summer rains. (Anderson)

However, when it was possible to attach a *Sturmgeschütz-Abteilung* to a division for a longer period, the cooperation succeeded. Dedicated infantry teams could be specially instructed and trained, thus creating a mutual understanding which resulted in a better cooperation during the battle. A good example of this 'new' cooperation were the few units which had the fortune to be provided with an integral *Sturmgeschütz* unit. These were StuGBrig 394 (under 18.ArtDiv), StuGBrig 189 (under 78.SturmDiv), StuGBrig 270 (under *Ski-JägerBrig* 1) and StuGBrig 177 (under 3.*Kavallerie* [cavalry] Brig).

In January 1943, the 78.InfDiv was re-organized as the 78.SturmDiv. *Sturmgeschütz-Abteilung* 189 (equipped with 22 vehicles) became an integrated part of the artillery detachment. But, this quickly became a subject for criticism.

An after-action report, dated 16 March 1943, by 78.SturmDiv after the unit had to deploy two of its three *Sturm-Regimenter* to repulse an attempted Soviet breakthrough southwest of Orel, stated:

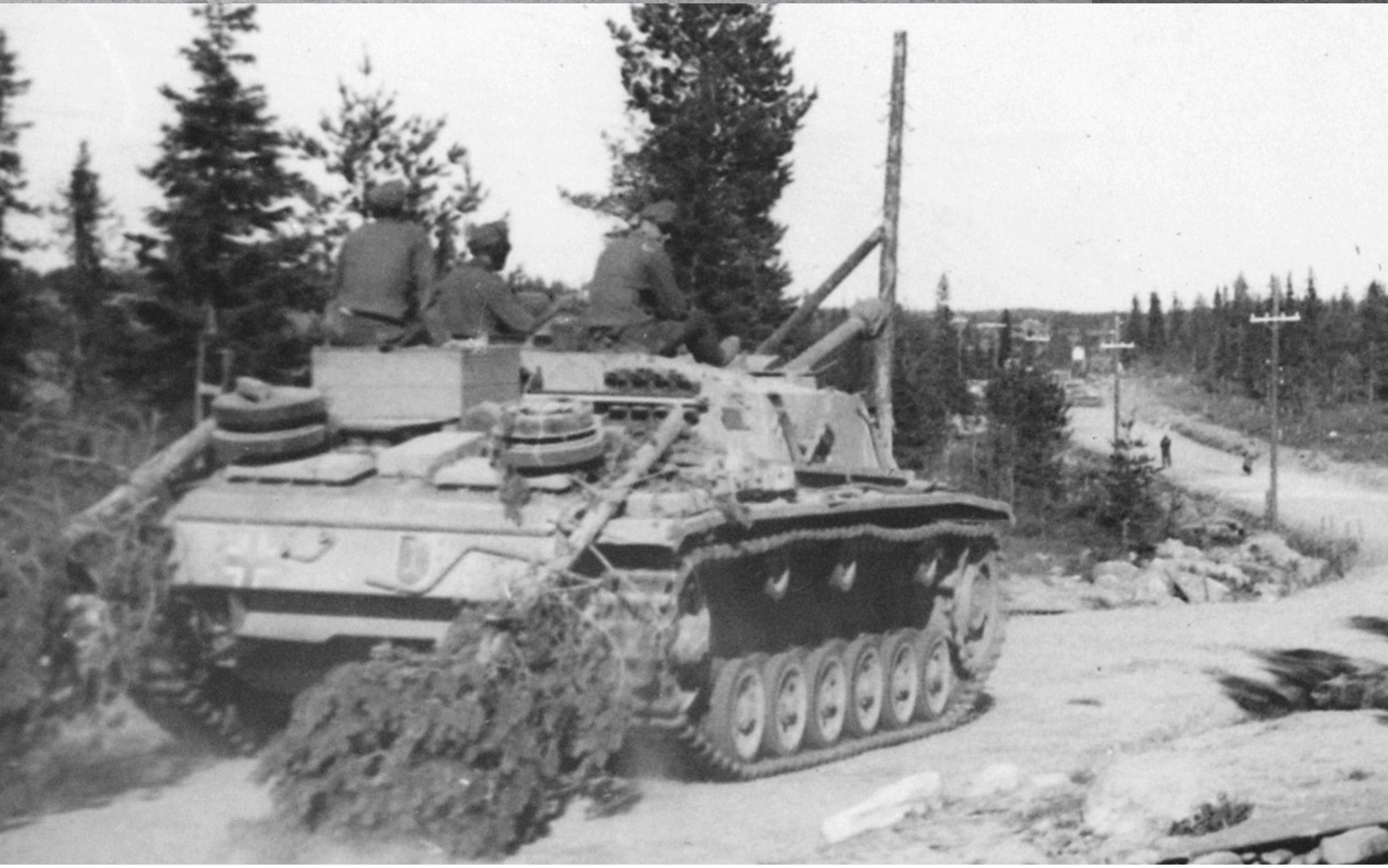
> Organization of the artillery:
> b.) *Sturmgeschütz-Abteilung*.
> The integration of the StuGAbt in the artillery regiment proved a failure…
> The StuGAbt has to be subordinated directly under the divisional commander.

It is difficult comprehend why the *Sturmgeschütz* were not issued to the command echelons of the infantry. However, the problem was easily solved. The next organizational structure for 78.SturmDiv, dated 12 April 1943, showed that StuGAbt 189 (now authorized to have 31 *Sturmgeschütz*) had been withdrawn from the artillery regiment. The unit would have to wait until June 1943 before it received the missing nine *Sturmgeschütz*. Sadly no combat reports have yet been found.

In October 1943, the situation on the Eastern Front became critical. High vehicle losses and inadequate supplies of all war materials threatened the operational readiness of many *Sturmgeschütz* units. O*rganisationsabteilung* made the suggestion:

> The high losses of *Sturmgeschütz* led to the idea of combining all combat ready *Sturmgeschütz* at the front into fewer units. The personnel of the remaining units would then be sent back to the Reich to be re-established. The already planned new establishments (one per month) would have to be cancelled. This is acceptable since the re-equipment using battle-proven crews with new *Sturmgeschütz* will be more practical. The O*perationsabteilung*, however, implies that such an action would not be possible in the near future.

This denial was possibly justified due to the desperate situation on all sectors of the Eastern Front. Even *Abteilungen* with ten combat ready *Sturmgeschütz* were more helpful than none at all. Only completely battle-worn units were sent back to the Reich for rest and re-equipment; all soft-skinned vehicles were distributed to other front-line units.



A *Sturmgeschütz* of StuGBrig 303 moves through the dense woods of northern Russia. The crew have attached pine trees to each side of their vehicle, either to conceal any traces of track marks, or to simulate a dust cloud caused by a larger unit. (Anderson)

Grenadier Escort Batteries for *Sturmgeschütz* Units

If a *Sturmgeschütz* unit had the good fortune to receive long-term support by grenadiers, its range of tactical applications broadened considerably.

The unclear situation for the respective commanding infantry units, which had to provide the manpower, led to thinking as to how it would be possible to provide a *Sturmgeschütz* unit with an integrated grenadier element. These ideas went even further, and by late 1943 two different types of escort battery had been developed.

In an ideal situation, each *Sturmgeschütz-Abteilung* was to be issued with a *Sturmgeschütz-Begleit-Batterie* (StuGBeglBttr), to provide direct protection for the *Sturmgeschütz*, and a *Begleit-Panzer-Batterie* (BeglPzBttr), to support the grenadiers and also the *Sturmgeschütz*. In February 1944, the *Oberkommando des Heeres* decided to create specialized support units for selected *Sturmgeschütz* units:

> To reinforce *Sturmgeschütz* units, troop trials are being planned. The following units are to be established by 1 March 1944:
>
> By StuGErs und AusbAbt 400 at Hadersleben

StuGBrig 270 was directly subordinated under *Ski-jäger-Brigade* 1. Grenadiers in winter clothing and armed with the 7.92mm *Sturmgewehr-Maschinen-Pistole* 44 (MP44), escort a *Sturmgeschütz* during an assault training exercise. A *Maschinengewehr* 42 is mounted for close defence against enemy infantry and the vehicle is equipped with the early type of *Winterketten*. (Anderson)

> a.) 4.StuGBeglBttr/StuGAbt 236
> 4.StuGBeglBttr/StuGAbt 905
>
> b.) 5.BeglPzBttr/StuGAbt 236
> 5.BeglPzBttr/StuGAbt 905
>
> By StuGErs und AusbAbt 300 at Neiße
> a.) 4.StuGBeglBttr/StuGAbt 667
> 5.BeglPzBttr/StuGAbt 667
> 6.BeglPzBttr/StuGAbt 667
>
> Before being transferred to the front, all units will be sent for training at the Altengrabow [near Drewitz] exercise area from 1 March 1944 to 15 March 1944. The 50 PzKpfw II will be provided by the *General Inspektor der Panzertruppe*.

All *Sturmgeschütz-Begleit-Batterie* (later renamed to *Begleit-Grenadier-Batterie*) were to be established according to KStN 448, dated 8 February 1944. The battery would be manned by battle-proven grenadiers; the elite of the infantry. To provide the grenadiers with maximum firepower, the largest number possible of *Maschinenpistole* (MP) 43/44 (*Sturmgewehr*) was demanded. Each unit was to have six 3-ton trucks and 19 light cross-country cars. The organizational structure shown on pages 238/242 is for guidance only, as divergent structures have been found in archives.

In June 1944, the OKH published guidelines for the *Sturmgeschütz-Begleit-Batterie* (StuGBeglBttr):

> 1.) In combat, *Sturmgeschütz* need to be protected by infantry, especially against enemy anti-tank teams… When attacking, the *Sturmgeschütz* have to rely on

> the support of engineers to clear mine fields and other obstacles.
>
> 2.) The infantry cannot provide these forces. In general, it also lacks the necessary training… To enable StuGBrig to perform as independently as possible, some units will be provided with StuGBeglBttr as their 4.*Batterie*.
>
> 3.) The StuGBeglBttr provides the *Sturmgeschütz* with the required infantry protection. The engineer platoon will clear, as far as it is possible, all pioneer related problems.
>
> 4.) It is the purpose of the StuGBeglBttr to increase the tactical success of the StuGBrig. In doing so, the battery will escort the *Sturmgeschütz* continuously regardless of any combat by the infantry.
>
> 7.) To commit a StuGBeglBttr as an independent infantry unit is wrong, as it is not suited for such action due to its training and composition. Despite allotment of the StuGBeglBttr, the *Sturmgeschütz-Brigade* is not able to take on a complete sector during attack or in defence. The basic requirements for the cooperation with *Sturmgeschütz* and infantry remain the same.
>
> 14.) The escort platoons will be subordinated to the three *Sturmgeschütz-Batterien*.
>
> 15.) The engineer platoon will be jointly deployed at the focal point according the combat situation.
>
> 18.) If the *Sturmgeschütz* advances, elements of the escorting grenadiers have to move into position to give covering fire.
>
> 22.) According to Appendix II, the engineer platoon can establish a *Schnellbrücke* (quick-build temporary bridge) with a capacity of 23t. The individual parts can be carried on the *Sturmgeschütz*.
>
> 27.) In combat, the StuGBeglBttr is dependent on the StuGBttr it is deployed with.
>
> Each platoon is to have only one truck for weapons, ammunition, equipment and baggage. To carry equipment for the engineer platoon the battery has to provide a separate truck with trailer.

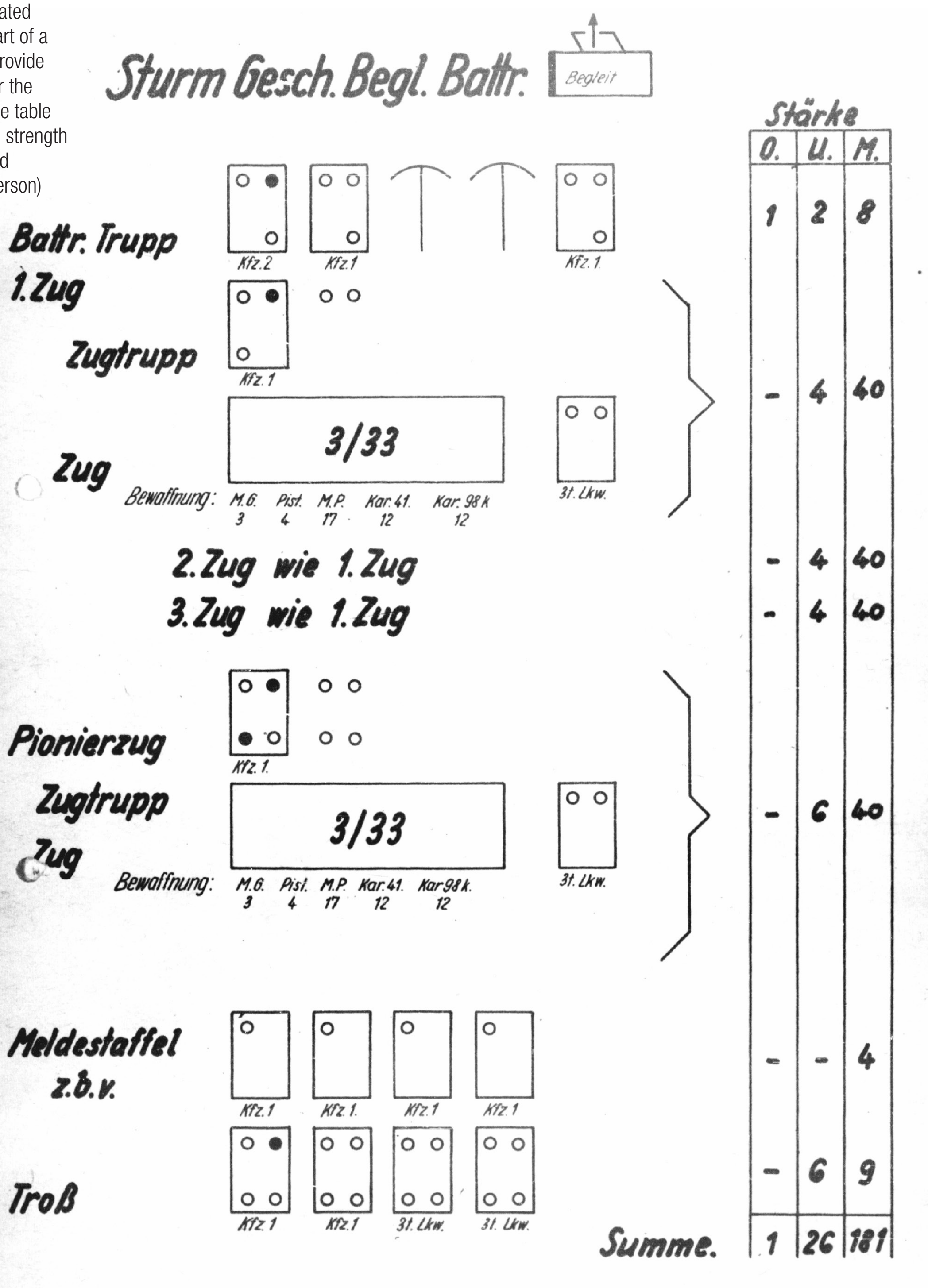
Begleit-Panzer-Batterie According to KStN 447

The escort tank battery contained 13 PzKpfw II tanks, along with support and transport elements. The tanks were to support the *Sturmgeschütz* with fire from their 2cm KwK 30 anti-tank canon and 7.92mm machine-gun, to suppress or destroy enemy anti-tank or infantry forces. The 50 PzKpfw II delivered by the replacement unit were in very bad condition, and only suitable for training duties. However, the escort units were not integrated into their new units until May 1944. For reasons unknown, the orders were partly changed. StuGBrig 905 did not receive the intended escort units, but StuGBrig 239 was issued with a BeglGrenBttr and a PzBeglBttr.

A telex message, dated 17 May 1944, said:

> StuGBeglBttr 4./667 and BeglPzBttr 5./667 will be transferred from Burg to *Heeresgruppe Mitte* at Orsha and integrated (according to the order of battle) into StuGBrig 667 by 19 May.

The *Sturmgeschutz-Begleit-batterie* (escort battery) was created as an integral part of a HStuArtBrig to provide close support for the assault guns. The table details the unit's strength in equipment and personnel. (Anderson)


Sturm Gesch. Begl. Battr.
Begleit
Battr. Trupp
Kfz. 2
Kfz. 1
Kfz. 1
1. Zug
Zugtrupp
Kfz. 1
Zug
3/33
3t. Lkw.
Bewaffnung: M.G. 3 Pist. 4 M.P. 17 Kar. 41 12 Kar. 98 k 12
2. Zug wie 1. Zug
3. Zug wie 1. Zug
Pionierzug
Zugtrupp
Kfz. 1.
Zug
3/33
3t. Lkw.
Bewaffnung: M.G. 3 Pist. 4 M.P. 17 Kar. 41. 12 Kar 98 k. 12
Meldestaffel z.b.V.
Kfz. 1
Kfz. 1.
Kfz. 1
Kfz. 1
Troß
Kfz. 1
Kfz. 1
3t. Lkw.
3t. Lkw.

	Stärke		
	O.	U.	M.
Battr. Trupp	1	2	8
1. Zug	-	4	40
2. Zug wie 1. Zug	-	4	40
3. Zug wie 1. Zug	-	4	40
Pionierzug	-	6	40
Meldestaffel z.b.V.	-	-	4
Troß	-	6	9
Summe.	1	26	181

From another telex message on 7 June 1944:

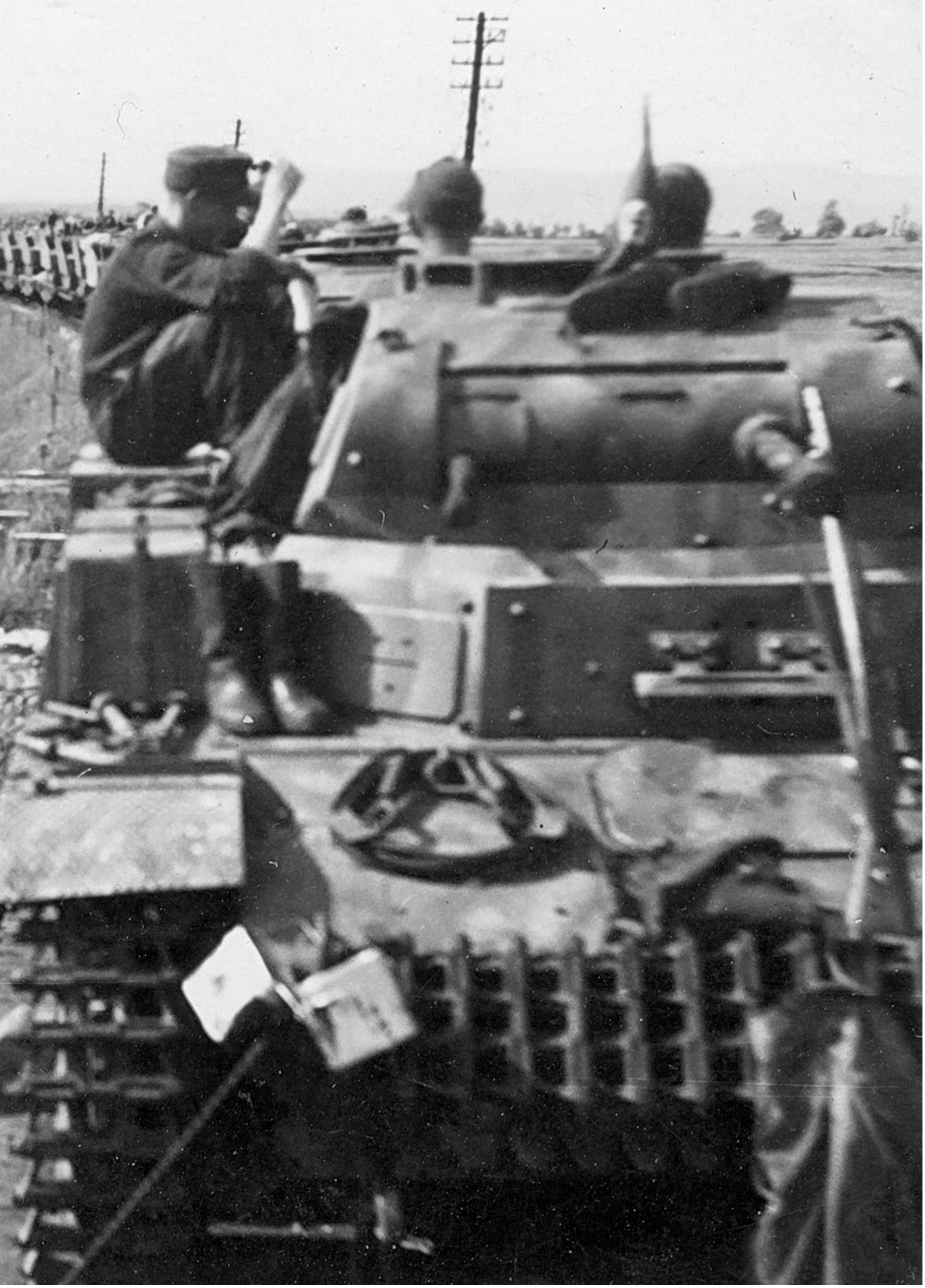
> BeglPzBttr 6./667 will be transferred from Burg to *Heeresgruppe Mitte* and integrated (according to the order of battle) into StuGBrig 667 by 19 May.

In October 1944, all units had received the new designation, *Heeres-Sturmartillerie-Abteilung* (HStuArtBrig). On 6 October, General Wenck, Chief of *Führungsgruppe* (management team) identified the units:

> 1.) The HStuArtBrig 236, 239 and 667 were established based on a special organizational structure to carry out a troop trial ordered by the *Führer*.
> 2.) Utilization of the *Begleiteinheiten* issued to *Heeres-Sturmartillerie-Brigaden* by other units is herewith prohibited.

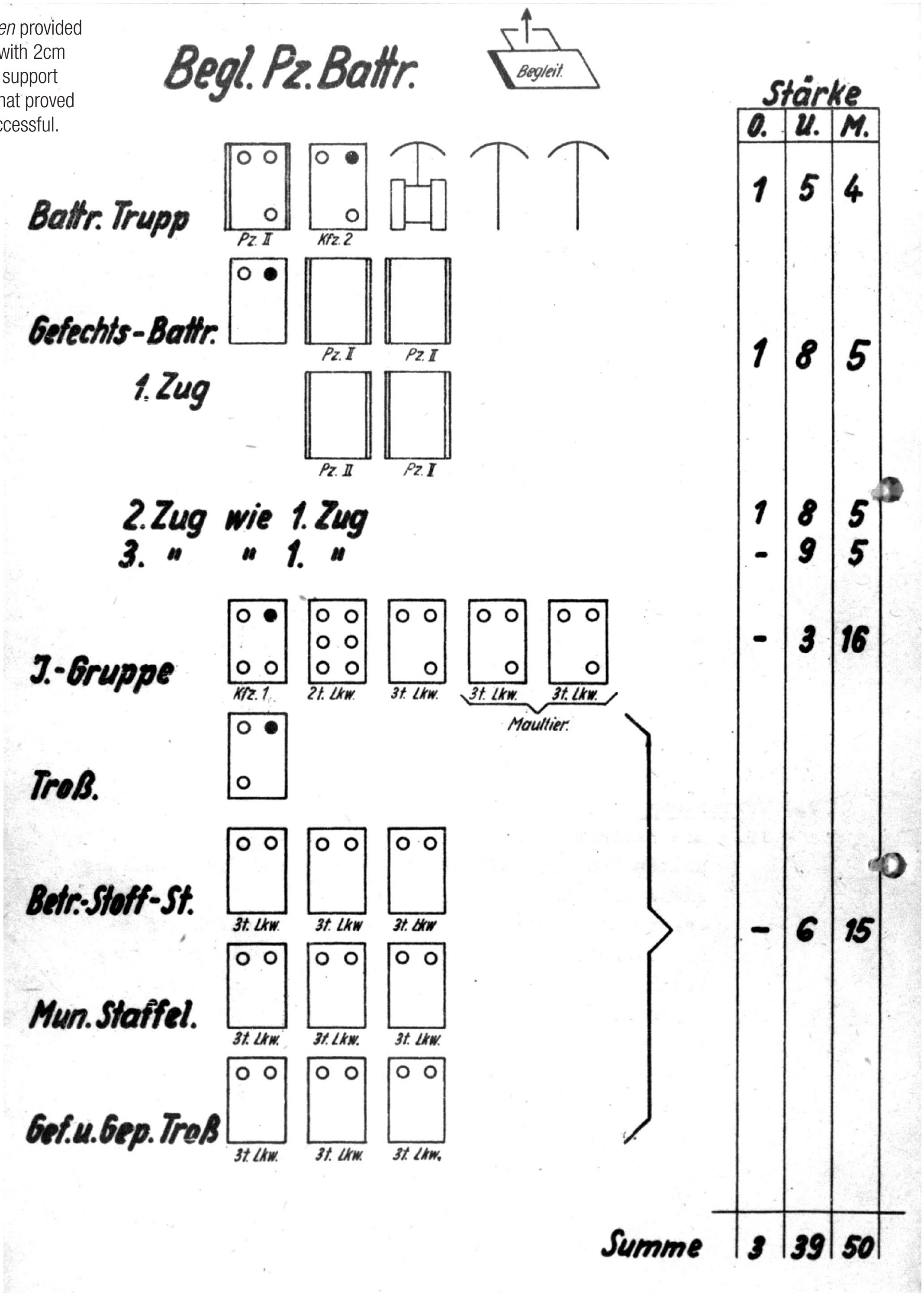
From August to September 1944, HStuArtBrig 239 was involved in heavy fighting in Romania. The commander of this unit delivered an after-action report:

> *General der Artillerie* of the OKH:
>
> Attached I send an experience report of HStuArtBrig 239 dealing with the combat in Romania from August to September 1944. The brigade has been issued with a *Begleitgrenadier-Batterie* (formerly *Sturmgeschütz-Begleit-Batterie*) and a *Begleit-Panzer-Batterie* (PzKpfw II) within the scope of a troop trial.
>
> Experience of HStuArtBrig 239.
>
> I.) Enemy:
> The Soviets faced the main thrust of the German attack, and almost totally used his annihilation tactics of 1941. Even the poorly-trained Soviet infantryman is made even stronger by an artillery bombardment which used vast amounts of ammunition.
> Their deployment of light, passenger car-sized armoured vehicles mounting a 2cm machine gun is most remarkable. The Soviets transport their infantry under cover of tanks and assault guns toward our lines in order to achieve a rapid break-through.
>
> Using their new tanks (T-34/85 and Josef Stalin) the Soviets attempt to open fire at ranges over 2,000m. At such distances the fire from our *Sturmkanonen* (L/48) is successful, but only by chance.
>
> II.) Organization:
> The brigade's division of three combat batteries, two escort batteries and a supply battery (*Stabsbatterie*), worked effectively.
>
> The *Begleit-Panzer-Batterie* (PzKpfw II) was, depending on the situation, used as a complete force or divided into platoons to assist the *Sturmgeschütz-Batterien*; both methods have proved their value. The *Begleit-Grenadier-Batterie* was always divided into the combat batteries. The *Pionier-Zug* remained under the control of the commander.



Elements of HStuArtBrig 239 during the rail transport to the east. The first vehicle is a PzKpfw II *Begleitpanzer* (escort tank) of the 5.PzBeglBttr. In the background are the 11 *Sturmgeschütz* of the unit, and all are fitted with *Panzerschürzen*. The usage of the 2cm KwK cannon and machine gun-armed light tanks was reported to have been most successful.

The *Panzer-Begleitbatterien* provided the StuGBrig with 2cm machine-gun support fire. A move that proved to be very successful. (Anderson)


Begl. Pz. Battr.
Begleit
Stärke
O.
U.
M.
Battr. Trupp
Pz. II
Kfz. 2
1
5
4
Gefechts-Battr.
Pz. II
Pz. II
1. Zug
Pz. II
Pz. II
1
8
5
2. Zug wie 1. Zug
3. " " 1. "
1
8
5
-
9
5
J.-Gruppe
Kfz. 1
2t. Lkw.
3t. Lkw.
3t. Lkw.
3t. Lkw.
Maultier.
-
3
16
Troß.
Betr.-Stoff-St.
3t. Lkw.
3t. Lkw
3t. Lkw
Mun. Staffel.
3t. Lkw.
3t. Lkw.
3t. Lkw.
Gef. u. Gep. Troß
3t. Lkw.
3t. Lkw.
3t. Lkw.
-
6
15
Summe
3
39
50

To make best use of the escort batteries, focal points were set up according to the situation. The use of these mixed combat groups proved to be extremely useful during the commitment in mountain terrain.

III. Tactical experiences:
1.) Without the allocation of sufficient infantry forces, the [StuG] brigade in its present form, as an independent combat group, cannot fulfill its missions. The *Sturmartillerie* is the strongest and is the best support for the grenadiers on the battlefield.

2.) The '*Russenschreck*' and '*Panzerpanik*' often observed in younger soldiers can only be overcome by exemplary leadership from officers in front-line positions. The appearance of a general staff officer at the front during the critical phase of the battle at Nagura considerably boosted morale amongst our troops.

3.) The exploitation of subordinate units [HStuArtBrig, author] to save our forces has led to insurmountable technical problems with the *Sturmgeschütz*. The call '*Sturmgeschütz vor*' may honour our branch, but may not result in moving back to the protection of our own anti-tank guns.

4.) Cooperation with superior authorities and the infantry:
The outstanding cooperation with 4.*Gebirgsdivision* has shown that the old tactical methods for cooperation by infantry and *Sturmgeschütz* will always lead to success. *Sturmgeschütz* are the backbone for the morale of the infantry. However, the infantry has to fight independently according to their own training. It must be clear that *Sturmgeschütz*, which change their position for tactical needs, will never let the infantry down.

The arbitrary establishment of *Alarmeinheiten* [in an emergency, the remnants of units were often combined into alert units and deployed by overburdened and incompetent military leaders, author] showed the absolute dependency on a particular leader's qualities… Due to such a withdrawal of men and material, the brigade suffered considerable losses which cannot be recovered. The order to abandon all trailers and to push all immobilized vehicles off the road to Kronstadt led to the loss of many very valuable vehicles… Only due to a most vigorous intervention by the (brigade) commander, which led to a heated argument, was this absurd order cancelled.

The dispersal of all units, essential during mountain combat, was thwarted by the massed creation of *Alarmeinheiten*. The rearguard had no freedom of movement; any retreat by a larger unit, when only one road was available, led to traffic congestion and delay. All orders to withdraw were given at the same time, despite persistent objections from the brigade commander. The enemy immediately adapted to this tactic; any disengagement was always poorly executed. The defending units were often overrun before the ordered withdrawal time, which allowed the enemy to closely follow and harass the rearguard.

The commitment of an energetically led small, mobile and dedicated combat group equipped with heavy weapons (*Sturmgeschütz*, PzKpfw II and self-propelled

A PzKpfw II *Begleitpanzer* of 5.PzBeglBttr in service with HStuArtBrig 239 in Russia during early winter 1944. Although useful, the ageing PzKpfw IIs proved to be somewhat mechanically unreliable. (Anderson)

2cm FlaK guns) would have cleared the situation more efficiently. A suggestion by the brigade to establish and lead such a combat group was not accepted.

The deployment of our own escort grenadiers will relieve our infantry and provide additional protection for the *Sturmgeschütz* against enemy snipers and anti-tank teams. The provision of the *Begleitgrenadiere* within *Sturmgewehre* has proved to be most successful.

The protection of forward command posts is within the duty of *Panzerjäger* units, and not the *Sturmgeschütz*. The request by some general staff officers to use *Sturmgeschütz* only for mobile anti-tank defence had to be explicitly and repeatedly declined.

5.) Cooperation with the *Panzertruppe*:
During the withdrawal the brigade was supported by elements of PzAbt 21. By ordering strict radio discipline this cooperation proved to be successful. Panzer II and Panzer IV provided valuable support fire for the *Sturmgeschütz*.

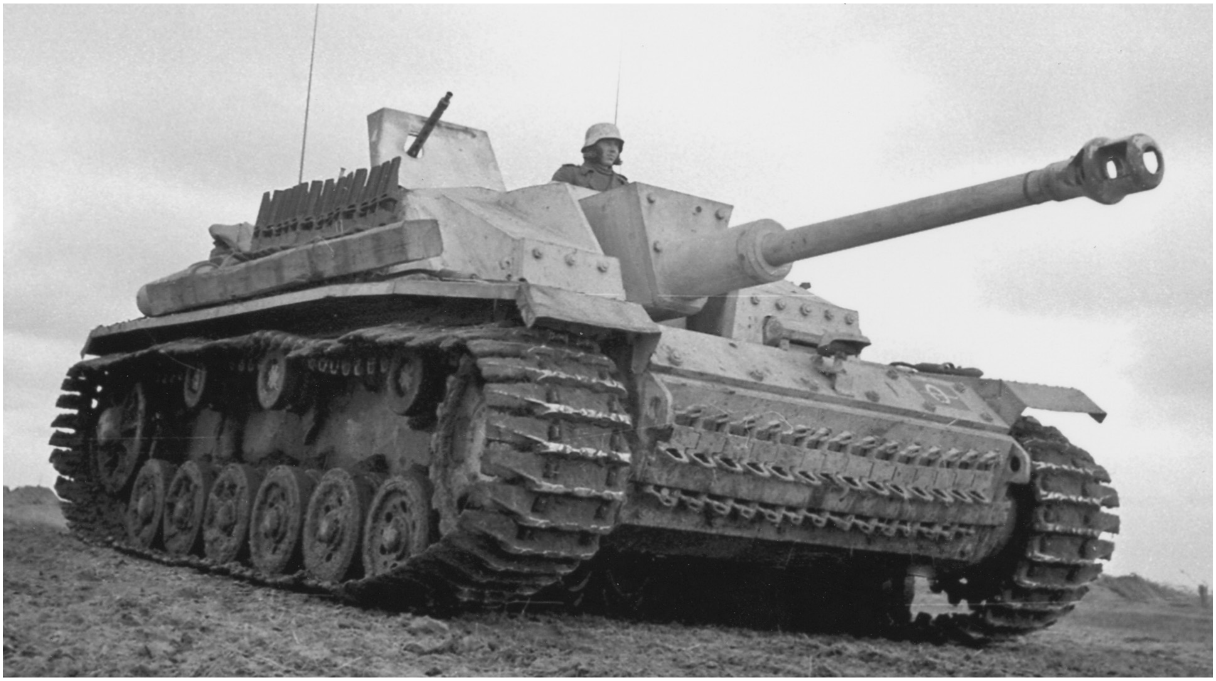
6.) Cooperation with *Flakartillerie*:
During the withdrawal, cooperation with *Flakartillerie* and *Luftwaffe* units was successful. While the *Sturmgeschütz* engaged the enemy, the towed anti-aircraft units could move into new positions. In reverse, they then could cover the *Sturmgeschütz*. Most 2cm FlaK on halftrack vehicles were used to reinforce the *Sturmgeschütz* and proved to be a most valuable addition and much feared by the Soviets.

IV.) Armament and equipment experiences:
Introduction of the *Sturmkanone lang* (L/70) would compensate for any inferiority against Soviet heavy tanks.

> The introduction of the *Sturmhaubitze* is a step towards assisting the infantry. The fire from this ordnance, especially zonal and concentrated, is greatly feared. Anti-tank gun concentrations were totally annihilated, paving the way for the *Sturmkanonen* and *Begleitpanzer*. The high-trajectory fire of the *Sturmhaubitze* combined with the effects of flat-trajectory fire from the *Sturmkanone*, supported by machine gun fire of the *Begleitpanzer* allows the *Sturmgeschütz* leader a greater number of tactical options. General staff officers tended to refuse the deployment of *Sturmhaubitze*, often over-riding the experienced opinion of the *Sturmgeschütz* leader. Preparatory support fire from the *Sturmhaubitze*, followed by a rapid counterattack by *Sturmkanonen* and PzKpfw II would ease any withdrawal.
>
> Support fire from the 2cm KwK and 7.92mm machine gun of the PzKpfw IIs makes a significant contribution to the fire from the *Sturmgeschütz*. If used correctly, our own infantry can easily break-through and mop up any pockets of enemy resistance. During combat in mountain terrain it proved to be extremely favourable to combine *Sturmgeschütz* and PzKpfw II in small battle groups, where all-round fire from the *Begleitpanzer*'s weapons was used to maximum effect.

This detailed report explains the enormous advantage of having the range of weapons available to the *Heeres-Sturmartillerie-Brigaden*. Other units not equipped with *Begleitpanzer-Batterien* often requested assistance from the FlaK section of a lead infantry unit.

Only three *Sturmgeschütz* units were established as *Heeres-Sturmartillerie-Brigade* (HStuArtBrig) with integrated PzBeglBttr and GrenBeglBttr. On November 1944, the *Generalstab des Heeres* demanded the development

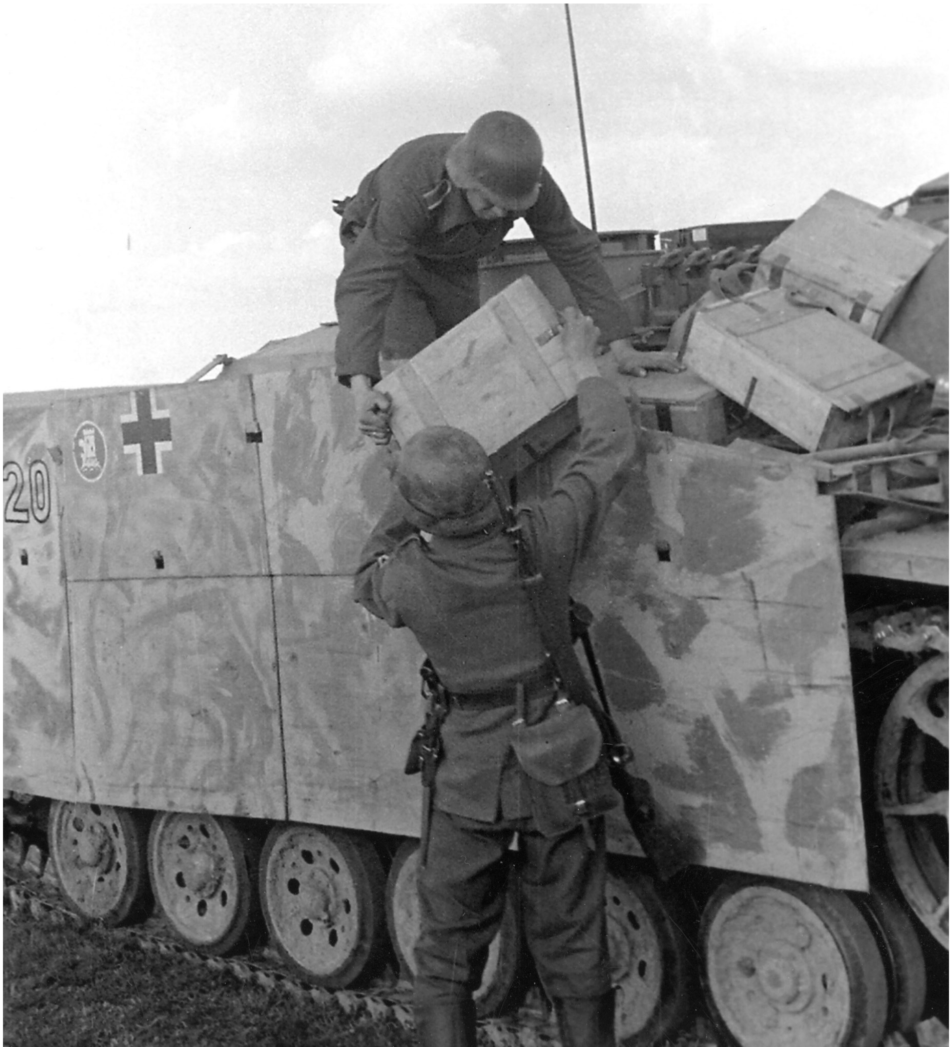


A *Sturmgeschütz* of HStuGBrig 270, fitted with the early type of *Winterketten*. Some links are lacking the extensions; this was caused by them bending under a load, and then partly breaking off. For an unknown reason, the unit has not been issued with *Panzerschürzen* for their vehicles. The emblem of 1.*Ski-jäger-Division* (a ski crossing a circle) is painted on the front plate. (Kadari) of HStuGBrig and HStuArtBrig, but this was far from reality bearing in mind the difficult supply situation. However, in November 1944, the *General der Artillerie* reported on the current situation:

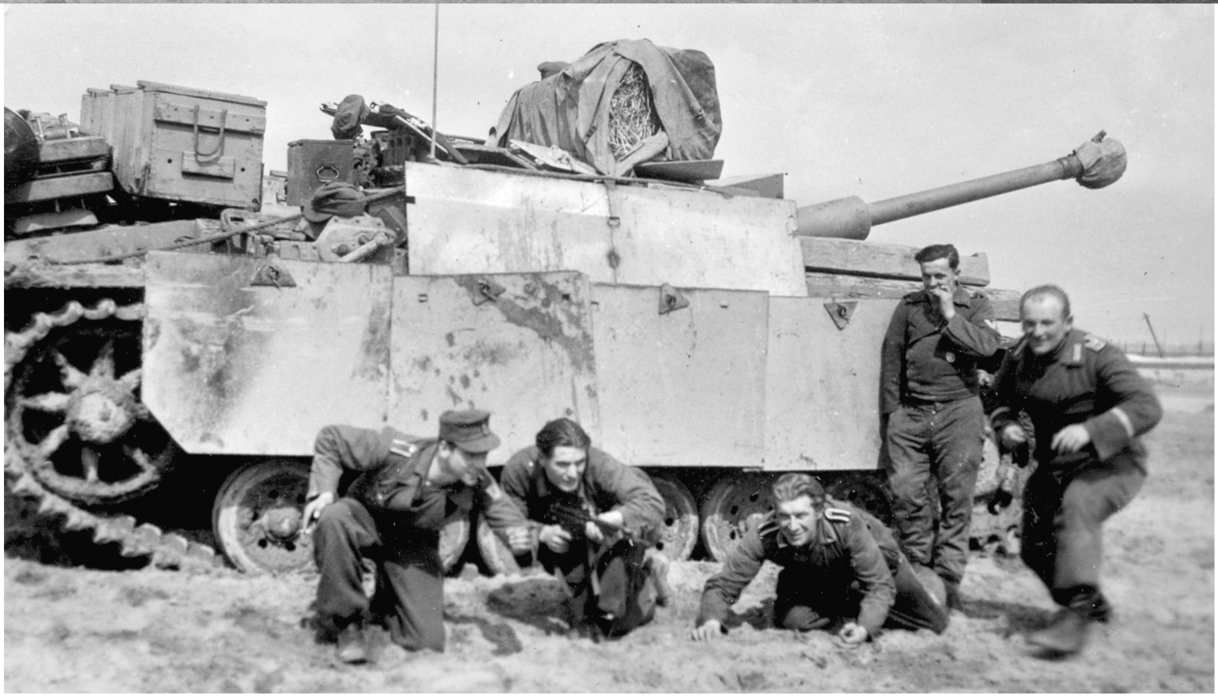
> The following brigades have StuGBeglBttr:
> 239 – *Hauptman* Bundesmann; in combat.
> 667 – *Hauptman* Rubig; to be formed at Posen.
> 236 – Major Kranz; to be formed at Posen.
> 905 – Major Braun: to be formed at Neisse.
> 911 – *Hauptman* Tornau; to be formed at Altengrabow.

A document dated 23 November 1944, proves that HStuGBrig 303, 905 and 911, which were being re-equipped, were to be re-designated as HStuArtBrig and issued with *Begleit-Grenadier-Batterien*.

On 15 December, the *Oberkommando des Heeres* decided to provide the following *Heeres-Sturmgeschütz-Brigaden* with one or two grenadier escort platoons:



Wooden crates filled with supplies are being stowed on the engine deck of a *Sturmgeschütz* Ausf G from HStuGBrig 185. The vehicle is fitted with the early type of *Panzerschürzen*: note the attachment brackets. The distinctive marking used by HStuGBrig 185 is on the second plate. A two-digit vehicle number is also visible. (Anderson)



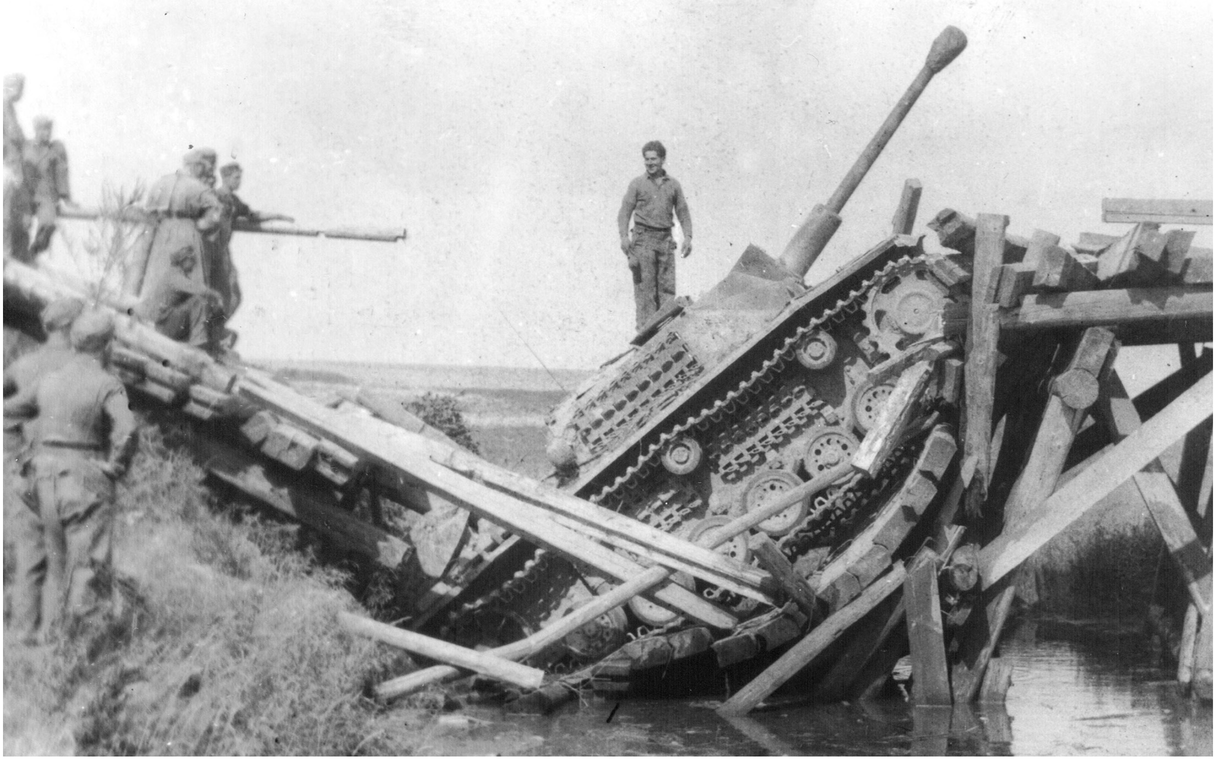
StuGBrig 190 made improvements to the *Panzerschürzen* on their vehicles. The original skirts have been mounted on rods which allowed them to swivel when striking an obstruction. Two smaller pieces of armour plate have been positioned to provide for extra protection to the superstructure. (Anderson)

HStuGBrig 600	Two platoons
HStuGBrig 226	Two platoons
HStuGBrig 184	One platoon
HStuGBrig 202	One platoon
HStuGBrig 393	One platoon
HStuGBrig 912	One platoon

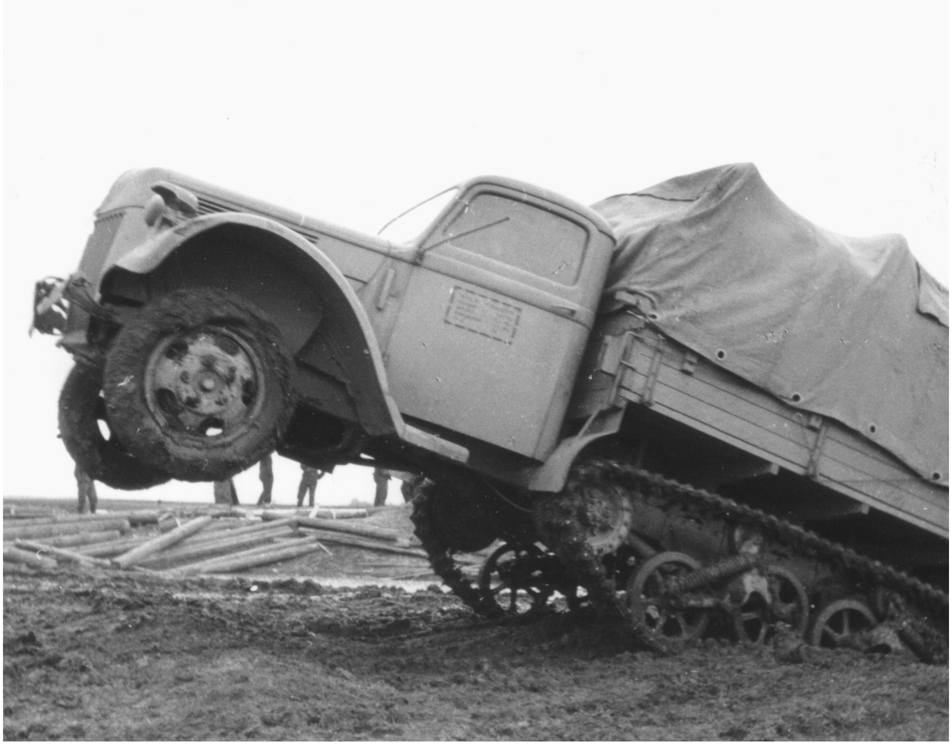
Re-designation as a *Heeres-Sturmartillerie-Brigaden* would take place when a unit was provided with a full-strength *Begleit-Grenadier-Batterie*.

In October 1944, it became obvious that only the OKH would decide on the autonomous establishment of infantry escort platoons for all *Panzerjäger* units equipped with *Sturmgeschütz* or *Jagdpanzer*:

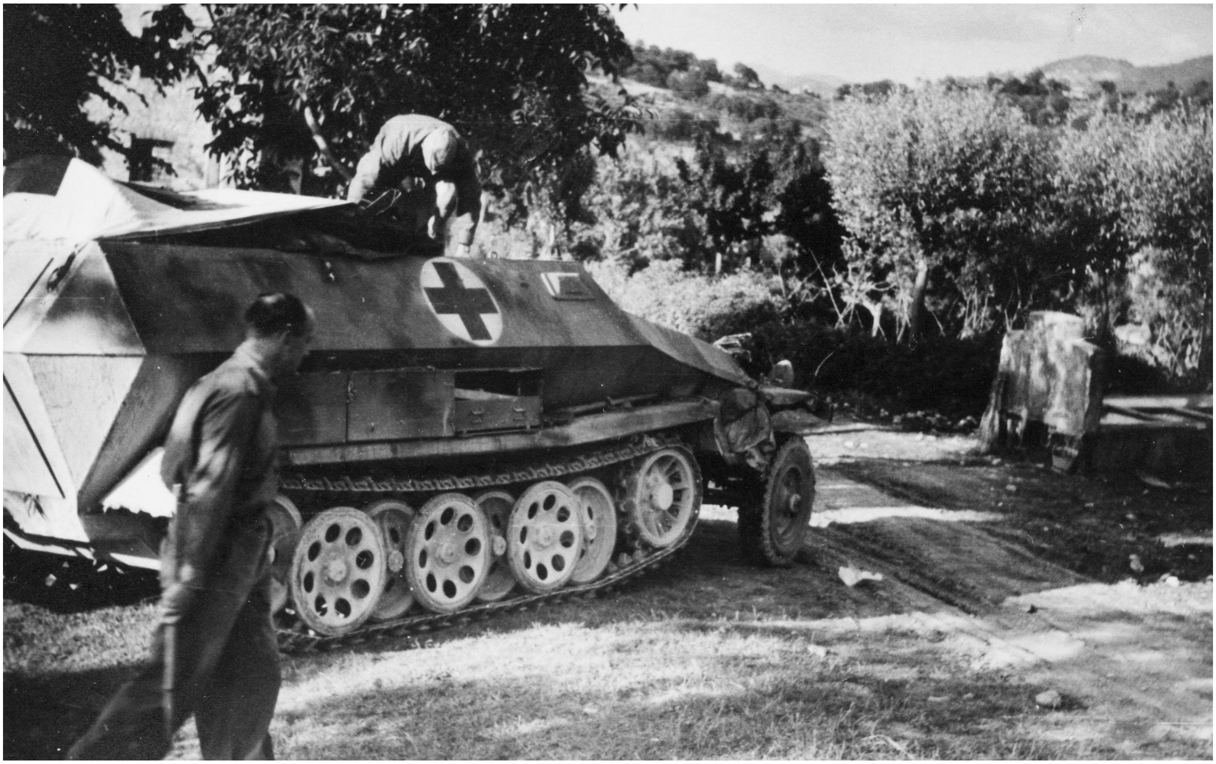
> To all *Heeresgruppen*:
>
> 1.) Experience has shown that when *Jagdpanzer* [*Sturmgeschütz*] were deployed in close-cooperation with infantry; most attack or defence operations could be accomplished even with an inferior force. However, where this cooperation was insufficient or missing, most missions often failed with considerable losses.
> *Sturmgeschütz* or *Jagdpanzer* must not be left isolated during any phase of the battle.
>
> 2.) To ensure this, we hereby order:
> a) All infantry units being supported by *Sturmgeschütz* or *Panzerjäger* shall establish a *Grenadier-Begleit-Zug* from its own resources. Only the most battle-experienced soldiers are to be selected.
> b) The *Grenadier-Begleit-Zug* will be permanently subordinated to the *Panzerjäger-Abteilung*.



Above: A wooden bridge has collapsed under the 23-ton weight of a *Sturmgeschütz* from HStuGBrig 210 and blocked the road for the entire *Abteilung*. The crew of the vehicle has mounted track links to the side plates of the superstructure for extra protection. (StuArt Archive)



Right: Beginning in 1943, *Sturmgeschütz* units deployed in the east received half-tracked supply trucks to meet the difficult conditions. The *Maultier* (mule) system was fitted to many types of truck, from heavy to light, and provided many units with a reliable cross-country transport vehicle. (Anderson)



Some *Sturmartillerie* units were issued with SdKfz 251/8 *Krankenpanzerwagen* (armoured ambulance). These highly-specialized vehicles allowed the recovery and transport of the wounded under armoured protection. The type carried four stretchers and a crew of two and was unarmed, except for two *Machinenpistole* 38s. (Anderson)

A *Grenadier-Begleit-Zug* was formed of one officer, five NCOs and 55 *Mannschaften* (enlisted men). All were to be armed with the most effective infantry weapon available at that time: the MP 44 *Sturmgehwehr*.

In November 1944, the OKH declared that all *Begleit-Panzer-Batterien* previously established were to be disbanded. This was probably due to there being insufficient PzKpfw II tanks available to replace the numerous losses. However, all available tanks remained with the units until they failed or were destroyed.

However, the escort tank proved to be a very valuable asset. It was not difficult for planners to notice that a new light tank comparable to the PzKpfw II would not be available in the forseeable future. Therefore, a new type of escort battery had to be sought with some urgency.

Sturmgeschütz-Begleitbatterie (gp)

The StuGBeglBttr (gp) was intended to provide the *Heeres-Sturmartillerie-Brigade* with considerable firepower. A temporary KStN was published in May 1944. The unit was formed of three platoons each equipped with SdKfz 251 (armoured halftrack vehicles). Firepower was provided by four SdKfz 251/17 mounting 2cm FlaK guns, operated by 1.*Zug* and 2.*Zug*. A *Halbgruppe* (half group) of six grenadiers was carried in an SdKfz 251/1. A substantial *Pionier* (engineer) platoon (3.*Zug*) was equipped with seven SdKfz 251/7 *Pioniergruppenwagen* for transportation.

It is not known whether this proposal was ever implemented. In June 1944, the *Organisationsabteilung* had already agreed the supply of equipment and, subject to availability, anticipated that delivery would begin in August 1944. Consequently, in the long term every StuGBrig was to be provided with:

One StuGBeglBttr according KStN 448.
One StuGBeglBttr (gp) according the provisional KStN (*Behelf*).

Establishment of Units with 45 *Sturmgeschütz*

In October 1943, the *Organisationsabteilung* reported on its plan to increase the number of *Sturmgeschütz* in each unit. It was planned for 42 *Sturmgeschütz-Abteilungen* to be equipped with 45 *Sturmgeschütz* each by the end of 1944.

However, due to the challenging supply situation at that time, the *Sturmartillerie* received only 52 per cent of *Sturmgeschütz* production, the remainder of the output was issued to Panzer and *Panzer-Grenadier*, and also to *Panzerjäger* in infantry divisions. Therefore, at the end of 1943 it was decided to increase the number of *Sturmgeschütz* from 31 to 45, but only in a few selected units.

The organizational structures were changed respectively. In February 1944 the older KStN 446a, dated 1 November 1942, for *Sturmgeschütz-Batterie* was adapted and complemented by a new KStN 446b, dated 1 February 1944. A *Gefechts-Batterie* (combat battery) was now authorized to have ten *Sturmgeschütz* and four *Sturmhaubitzen*. The three formerly independent *Batterietross* supply columns were combined into one, and as motorcycles proved to be unsuitable for conditions on the Eastern Front, their numbers were significantly reduced. These were partly substituted by NSU-built SdKfz 2 *Kettenkrad* halftracks and Kfz-1 *Kübelwagen* light cross-country cars. The staff battery received two VW Typ

The introduction of heavily-armoured tanks such as the *Josef* Stalin JS-2 by the Soviets, posed a serious threat to all German tanks: especially the *Sturmgeschütz*. This particular vehicle was destroyed by *Sturmgeschütz* of StuGBrig 912 during the summer of 1944. (StuArt archive)

The full establishment of *Sturmhaubitzen* from HStuGBrig 210: all are fitted with *Panzerschürzen* which provided reliable protection against Soviet anti-tank rifles. (Anderson)

166 K2 *Schwimmwagen*, amphibious vehicles; a versatile type for reconnaissance duties. The number of soft-skinned vehicles remained virtually unchanged. Due to the difficult terrain two SdKfz 10 light halftracks were issued.

Only four months later, KStN 446a and 446b were combined as it became clear that the planned increase from 31 *Sturmgeschütz* in each brigade to 45 was unachievable. The new KStN 466, dated 1 June 1944, was relevant for batteries which had been authorized to have 10 to 14 *Sturmgeschütz*. Compared to the older structure, the number of soft-skinned vehicles was substantially reduced, a hint to a further worsening of the supply situation.

The ammunition trucks of the *Gefechts-Batterie* were withdrawn and combined in a smaller section of seven trucks, also a *Kettenkrad* and a *Scwhimmwagen* were withdrawn. The reduction to three combat platoons was insignificant, since it was always within the brigade commander's competence to restructure his unit.

The staff and staff battery of a *Sturmgeschütz-Brigade* was also changed to fit the size of the unit (KStN 416, dated 1 June 1944). If the combat batteries were authorized to have 14 *Sturmgeschütz*, the brigade staff received two additional vehicles, and the supply echelon an extra fuel truck.

By 1 July 1944, only five units – StuGBrig 191, StuGBrig 279 and StuGBrig 259, StuGBrig 341 and StuGBrig 303 – were authorized to have 45 *Sturmgeschütz* in each brigade.

All remaining brigades were authorized to have 31 *Sturmgeschütz* in each *Abteilung*. However, towards the end of the war, some units had surplus vehicles. A status report, dated 2 February 1945, noted that StuGLehrBrig had 42 *Sturmgeschütz*, StuGBrig 278 had 39, StuGBrig 600 had 42, and StuGBrig 226 had 33. StuGBrig 912 had 44, StuGBrig 393 had 34 and also StuGBrig 202 had 41. (The totals include those combat ready, in the workshop or authorized new deliveries)

Renaming *Sturmartillerie* Units

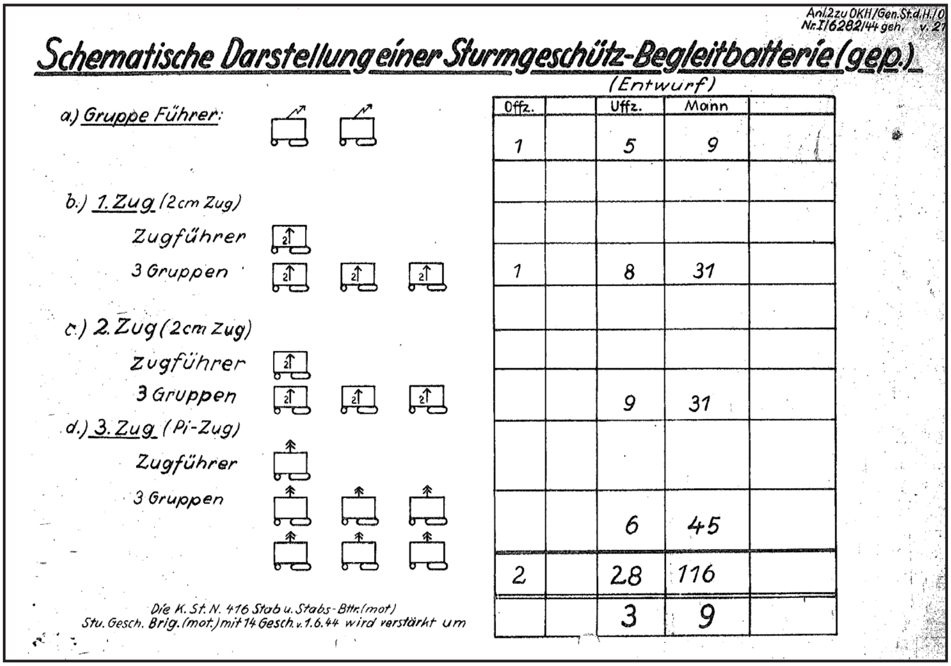
In March 1944, it was decided to rename all formations equipped with *Sturmgeschütz*. This was possibly done to ease differentiation between *Sturmartillerie* units (*Heerestruppe*) and other branches:

> *Sturmartillerie:*
> *Sturmgeschütz-Abteilung* will change to *Sturmgeschütz-Brigade.*
>
> *Sturmgeschütz* units within PzJgAbt of *Infanterie-, Jäger-* and *Gebirgsdivisionen:*
> PzJgKp (*Sturmgeschütz*) will change to *Sturmgeschütz-Abteilung.*
>
> Independent *Sturmgeschütz-Batterien* within divisions:
> *Sturmgeschütz-Batterie* (10 to 14 vehicles) will change to *Sturmgeschütz-Abteilung* (10 to 14 vehicles).

As for the *Heerestruppen*, the situation would become even more complicated in June 1944, after the *Begleit-Batterien* (escort batteries) were issued to their mother units. The units were again renamed:

> *Sturmgeschütz-Brigaden* without *Begleit-Batterien:*
> *Heeres-Sturmgeschütz-Brigade.*
>
> *Sturmgeschütz-Brigaden* with *Begleit-Batterien:*
> *Heeres-Sturmartillerie-Brigade.* These were the *Heeres* StuArtBrig 236, 239 and 667.

Left: A *Ritterkreuzträger* (Knight's Cross holder) of StuBrig 185 explains details of his *Sturmgeschütz* to a high-ranking infantry officer. The assault gun has been heavily modified by the unit; the *Panzerschürzen* has been completely removed and replaced with spare track, also the bullet traps on the superstructure have been covered with concrete. (Anderson)



Anl.2 zu OKH/Gen.St.d.H./O
Nr.I/6282/44 geh. v. 27

Schematische Darstellung einer Sturmgeschütz-Begleitbatterie (gep.)

(Entwurf)

	Offz.		Uffz.	Mann	
a.) Gruppe Führer:	1		5	9	
b.) 1. Zug (2cm Zug)					
Zugführer					
3 Gruppen	1		8	31	
c.) 2. Zug (2cm Zug)					
Zugführer					
3 Gruppen			9	31	
d.) 3. Zug (Pi-Zug)					
Zugführer					
3 Gruppen			6	45	
	2		28	116	
Die K.St.N. 416 Stab u. Stabs-Bttr.(mot) Stu.Gesch.Brig.(mot.) mit 14 Gesch. v.1.6.44 wird verstärkt um			3	9	

When the *Panzer-Begleitbatterien* were disbanded, a new structure was created. The *Sturmgeschütz-Begleitbatterie* (gp – *gepanzert* – armoured) was equipped with SdKfz 251/1 *mittlere Schützenpanzerwagen* (m gep SPW – medium armoured personnel carrier) some of which were SdKfz 251/17 armed with a 2cm FlaK 38. (Anderson)

> *Sturmgeschütz* units permanently subordinated under greater units: *Sturmgeschütz-Brigade.*

These units were StuGBrig 394 (under 18.ArtDiv), StuGBrig 189 (under 78.SturmDiv), StuGBrig 270 (under Ski-JägerBrig 1) and StuGBrig 177 (under 3.KavBrig).

The new designations did not necessarily give an idea of the authorized strength for each battery. In principle a unit could have 22, 31 or 45 *Sturmgeschütz*, as both KStN 446 and 446a remained valid.

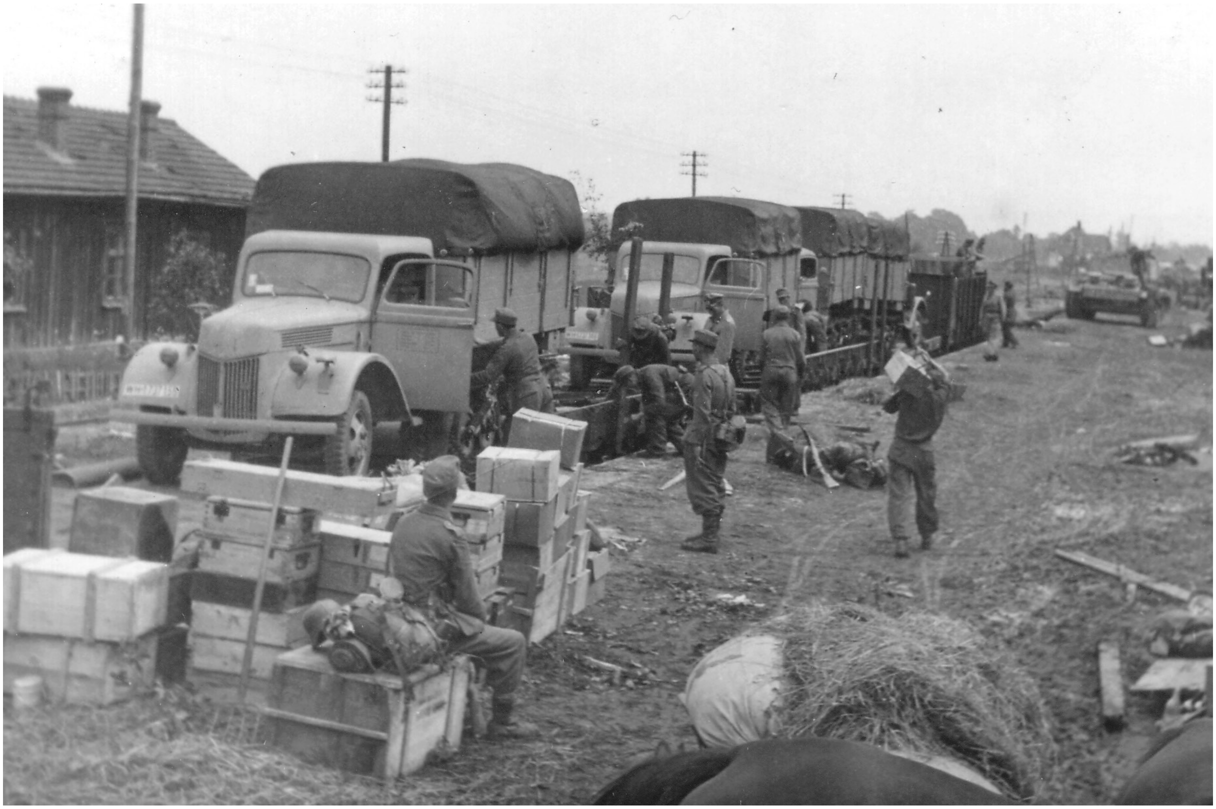
However, *Sturmgeschütz* production, which reached an output of 320 units by March 1944, was too low to fulfill the requirements of the *Artillerie*, *Panzer* and *Panzer-Grenadiertruppe* and the *Panzerjäger*.

In November 1944, the *Organisationsabteilung* decided:

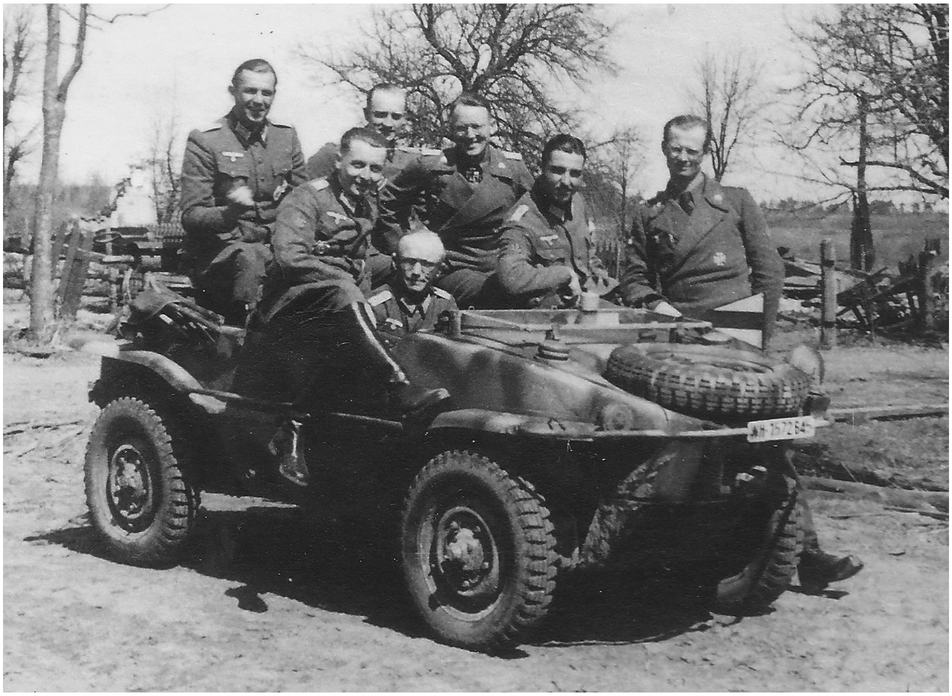
1.) The hitherto *Sturmgeschütz Begleit-Batterien* issued to *Heeres Sturmartillerie-Brigaden* will be renamed with immediate effect to:-

Begleit-Grenadier-Batterie.

2.) It is intended to equip all HStuGBrig with one *Begleit-Grenadier-Batterie* when being re-equipped at Heimat.

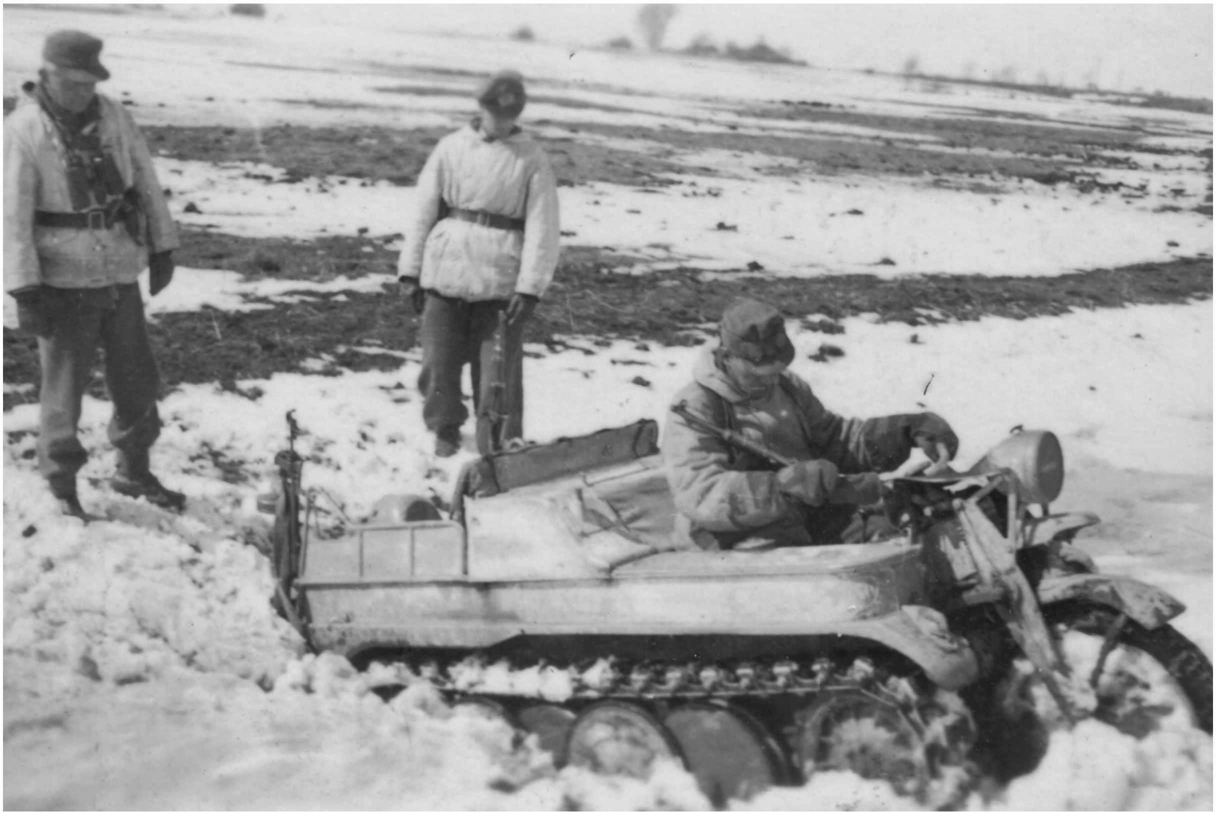


Ford 3-ton *Maultier* trucks of StuGBrig 189 loaded on railway wagons in preparation for transport to the east. The vehicles were converted by replacing the conventional rear axle with a Carden Lloyd-type tracked bogie. The vehicle was steered normally, but a sharp turn was only achieved by heavy braking on one of the tracks. (Anderson)



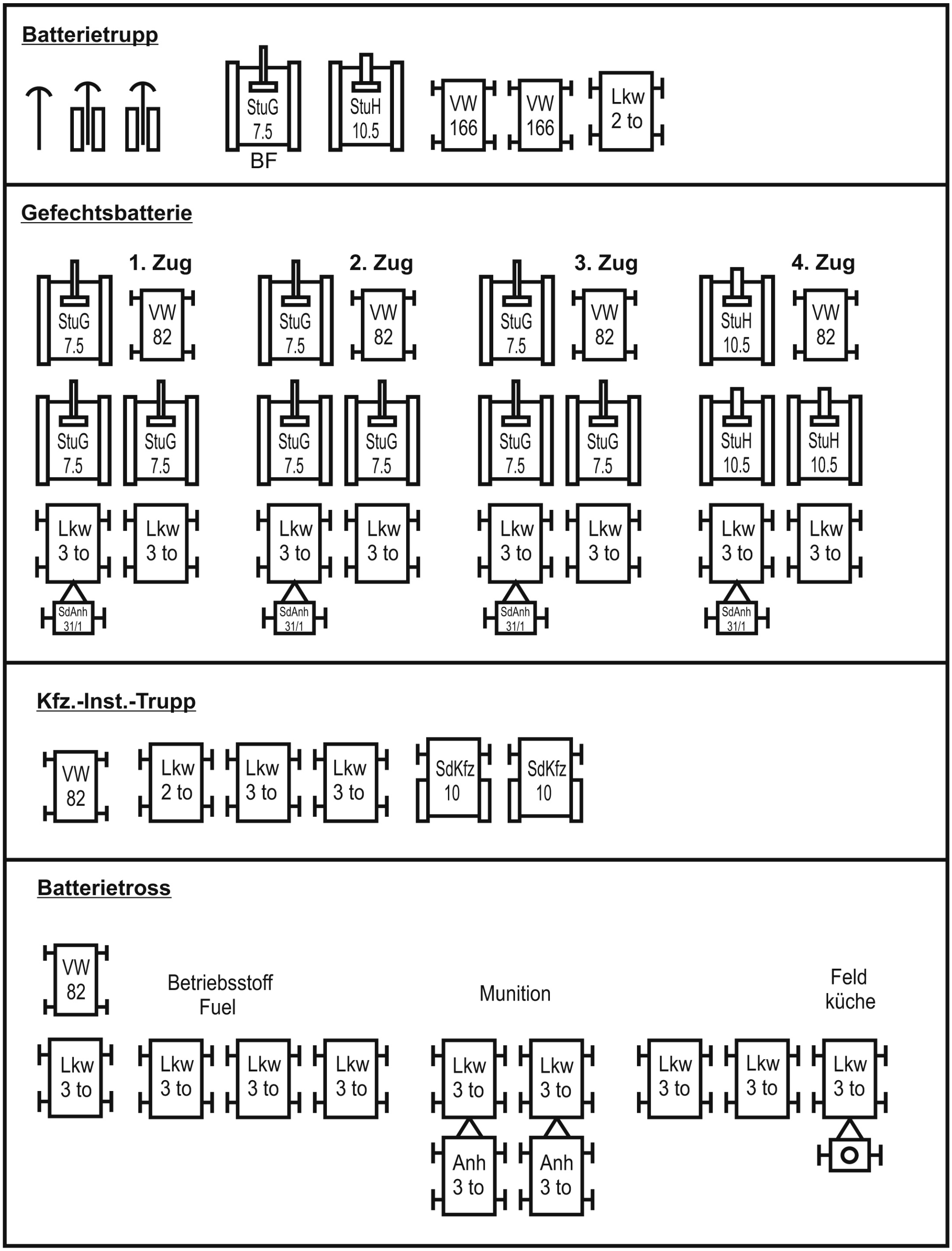
Left: Built by Volkswagen (VW), the amphibious four-wheel drive *Typ* 166 *Schwimmwagen* had a 25hp air-cooled petrol engine. For operating in water, a propeller-drive unit was fitted at the rear of the vehicle. Despite being somewhat underpowered, it proved to be one of the most versatile vehicles of World War II. (Anderson)

Below: An SdKfz 2 *Kettenkrad* (halftrack motorcycle) traversing a snow-filled ditch. The type was introduced as a light tractor but, due to its cross-country ability, it was chosen to replace the *Beiwagen-Krad* (motorcycle and side car combination). (Anderson)



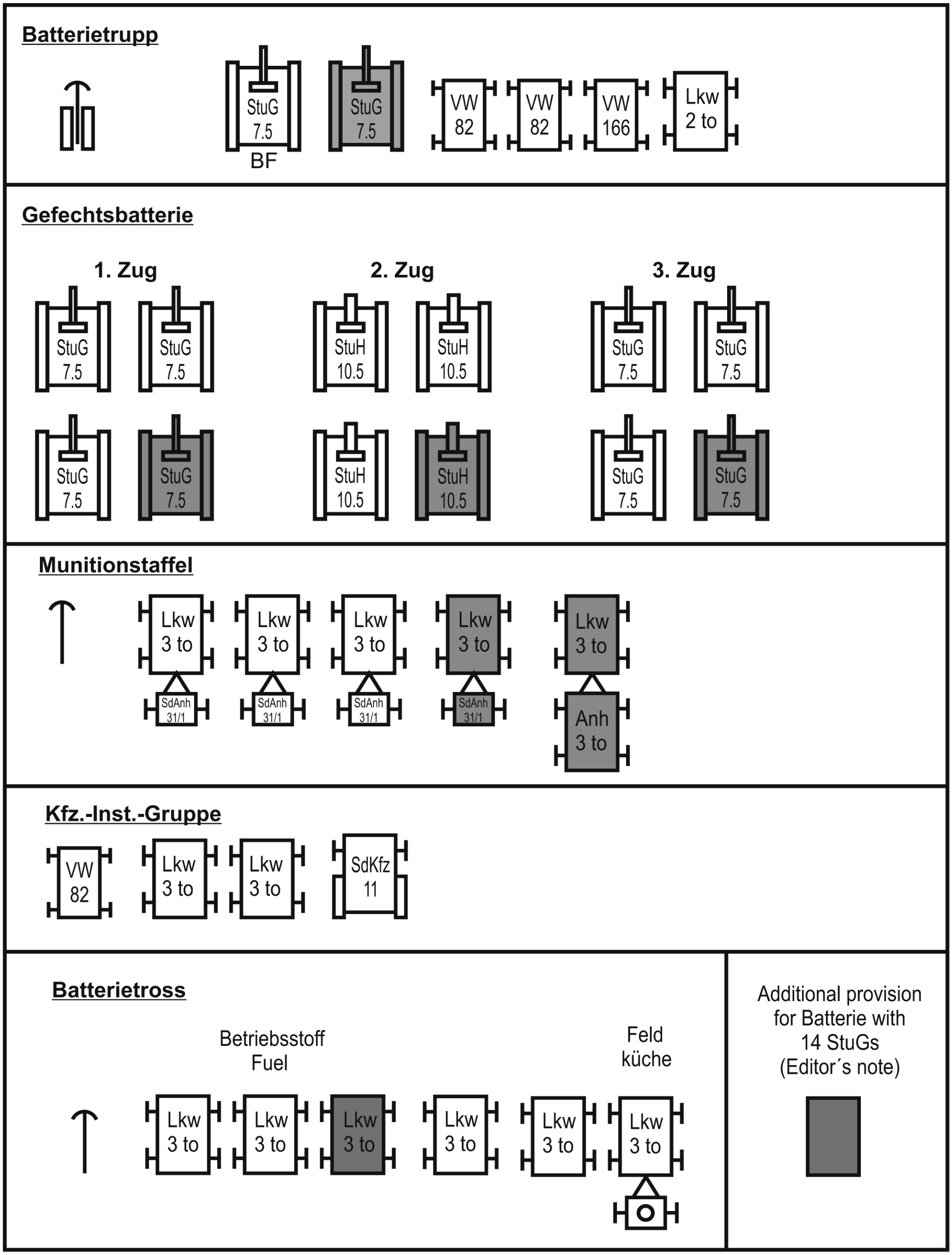
Sturmgeschützbatterie

Table of organization, (Fourteen StuGs) according to KStN 446b, dated 1 February 1944


Batterietrupp
StuG 7.5
BF
StuH 10.5
VW 166
VW 166
Lkw 2 to
Gefechtsbatterie
1. Zug
StuG 7.5
VW 82
StuG 7.5
StuG 7.5
Lkw 3 to
Lkw 3 to
SdAnh 31/1
2. Zug
StuG 7.5
VW 82
StuG 7.5
StuG 7.5
Lkw 3 to
Lkw 3 to
SdAnh 31/1
3. Zug
StuG 7.5
VW 82
StuG 7.5
StuG 7.5
Lkw 3 to
Lkw 3 to
SdAnh 31/1
4. Zug
StuH 10.5
VW 82
StuH 10.5
StuH 10.5
Lkw 3 to
Lkw 3 to
SdAnh 31/1
Kfz.-Inst.-Trupp
VW 82
Lkw 2 to
Lkw 3 to
Lkw 3 to
SdKfz 10
SdKfz 10
Batterietross
VW 82
Lkw 3 to
Betriebsstoff Fuel
Lkw 3 to
Lkw 3 to
Lkw 3 to
Munition
Lkw 3 to
Lkw 3 to
Anh 3 to
Anh 3 to
Lkw 3 to
Lkw 3 to
Feld küche
Lkw 3 to

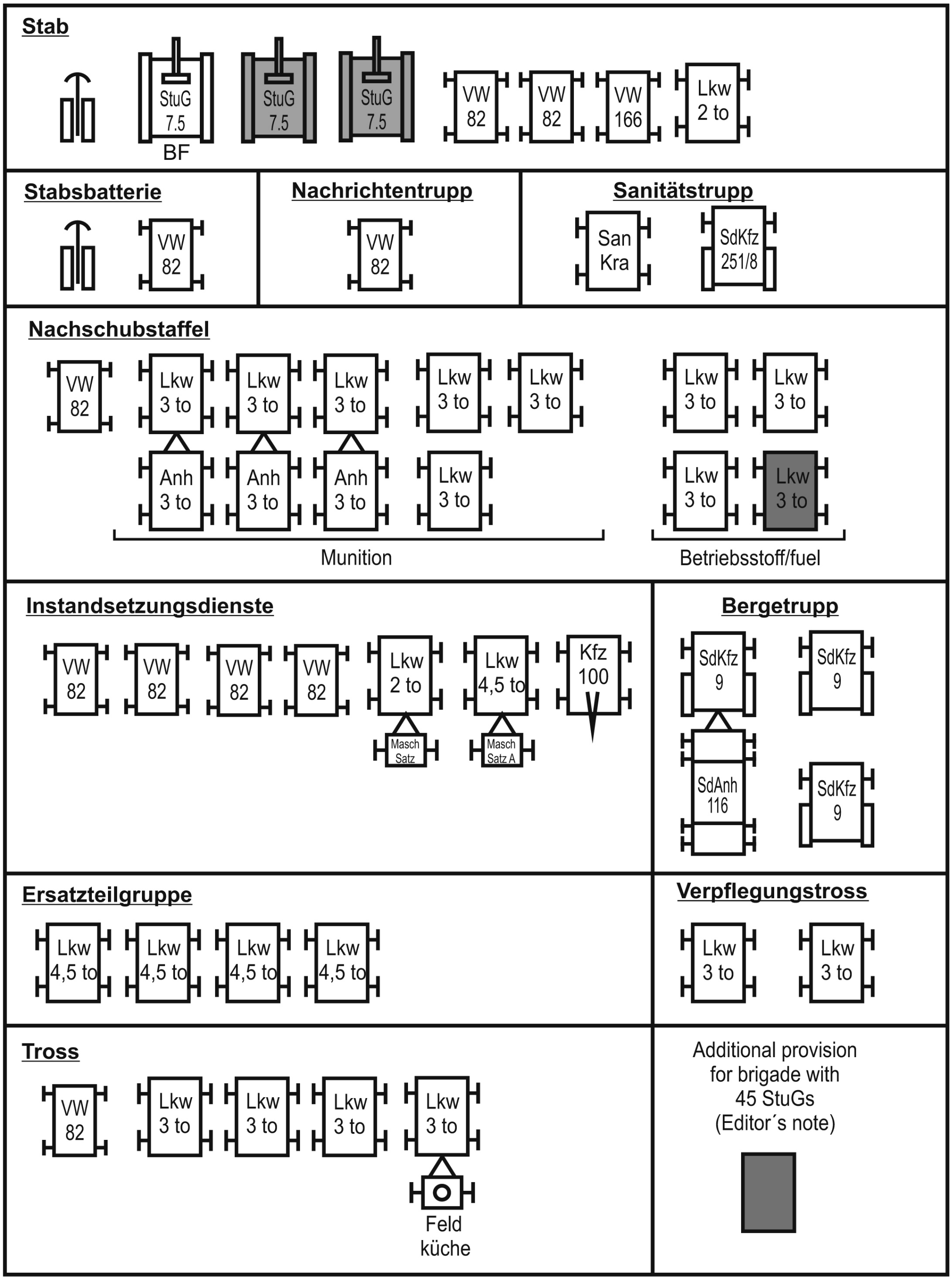
Sturmgeschützbatterie

Table of organization, (Ten or Fourteen StuGs) according to KStN 446, dated 1 June 1944


Batterietrupp
StuG 7.5
BF
StuG 7.5
VW 82
VW 82
VW 166
Lkw 2 to
Gefechtsbatterie
1. Zug
StuG 7.5
StuG 7.5
StuG 7.5
StuG 7.5
2. Zug
StuH 10.5
StuH 10.5
StuH 10.5
StuH 10.5
3. Zug
StuG 7.5
StuG 7.5
StuG 7.5
StuG 7.5
Munitionstaffel
Lkw 3 to
SdAnh 31/1
Lkw 3 to
SdAnh 31/1
Lkw 3 to
SdAnh 31/1
Lkw 3 to
SdAnh 31/1
Lkw 3 to
Anh 3 to
Kfz.-Inst.-Gruppe
VW 82
Lkw 3 to
Lkw 3 to
SdKfz 11
Batterietross
Betriebsstoff Fuel
Lkw 3 to
Lkw 3 to
Lkw 3 to
Lkw 3 to
Lkw 3 to
Feld küche
Lkw 3 to
Additional provision for Batterie with 14 StuGs (Editor´s note)

Stab und Stabsbatterie for a StuGBrig

Table of organization, (31 or 45 StuGs) according to KStN 416, dated 1 June 1944

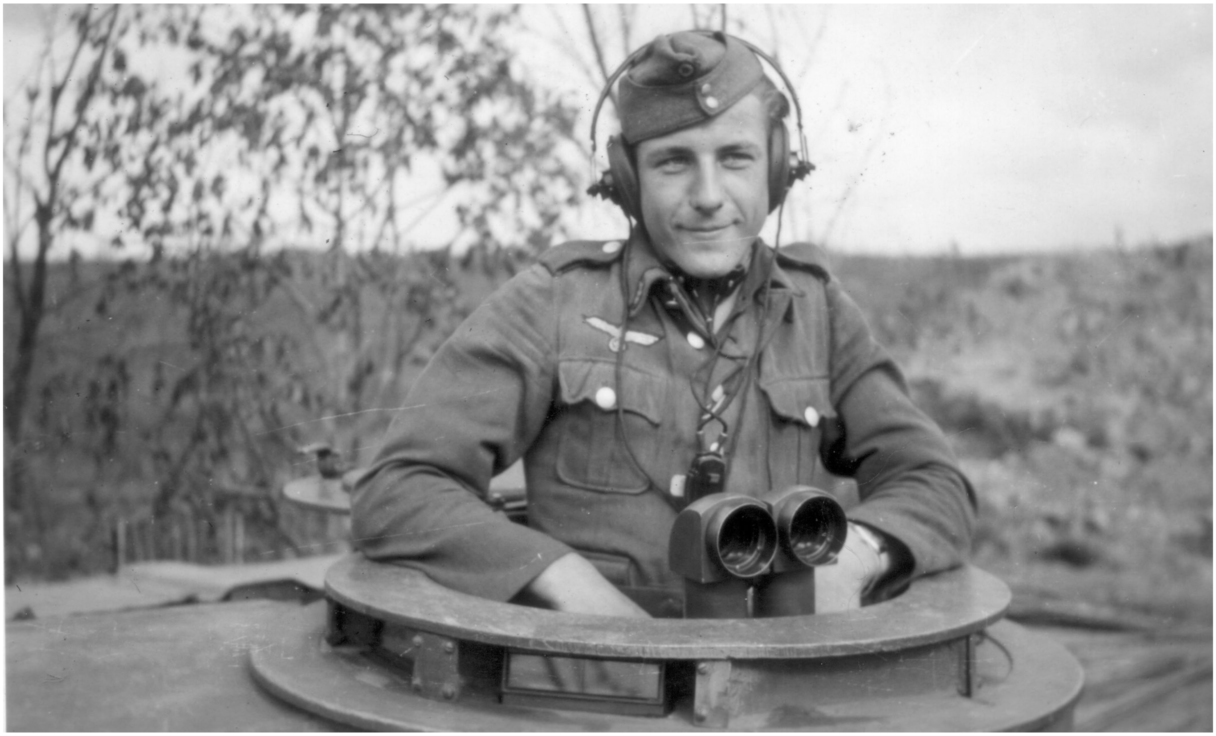

Stab
StuG 7.5
BF
StuG 7.5
StuG 7.5
VW 82
VW 82
VW 166
Lkw 2 to
Stabsbatterie
VW 82
Nachrichtentrupp
VW 82
Sanitätstrupp
San Kra
SdKfz 251/8
Nachschubstaffel
VW 82
Lkw 3 to
Lkw 3 to
Lkw 3 to
Lkw 3 to
Lkw 3 to
Anh 3 to
Anh 3 to
Anh 3 to
Lkw 3 to
Munition
Lkw 3 to
Lkw 3 to
Lkw 3 to
Lkw 3 to
Betriebsstoff/fuel
Instandsetzungsdienste
VW 82
VW 82
VW 82
VW 82
Lkw 2 to
Masch Satz
Lkw 4,5 to
Masch Satz A
Kfz 100
Bergetrupp
SdKfz 9
SdAnh 116
SdKfz 9
SdKfz 9
Ersatzteilgruppe
Lkw 4,5 to
Lkw 4,5 to
Lkw 4,5 to
Lkw 4,5 to
Verpflegungstross
Lkw 3 to
Lkw 3 to
Tross
VW 82
Lkw 3 to
Lkw 3 to
Lkw 3 to
Lkw 3 to
Feld küche
Additional provision for brigade with 45 StuGs (Editor´s note)

On 5 March 1944, the *Panzeroffizier* (tank officer) at the *Generalstab des Heeres* reported:

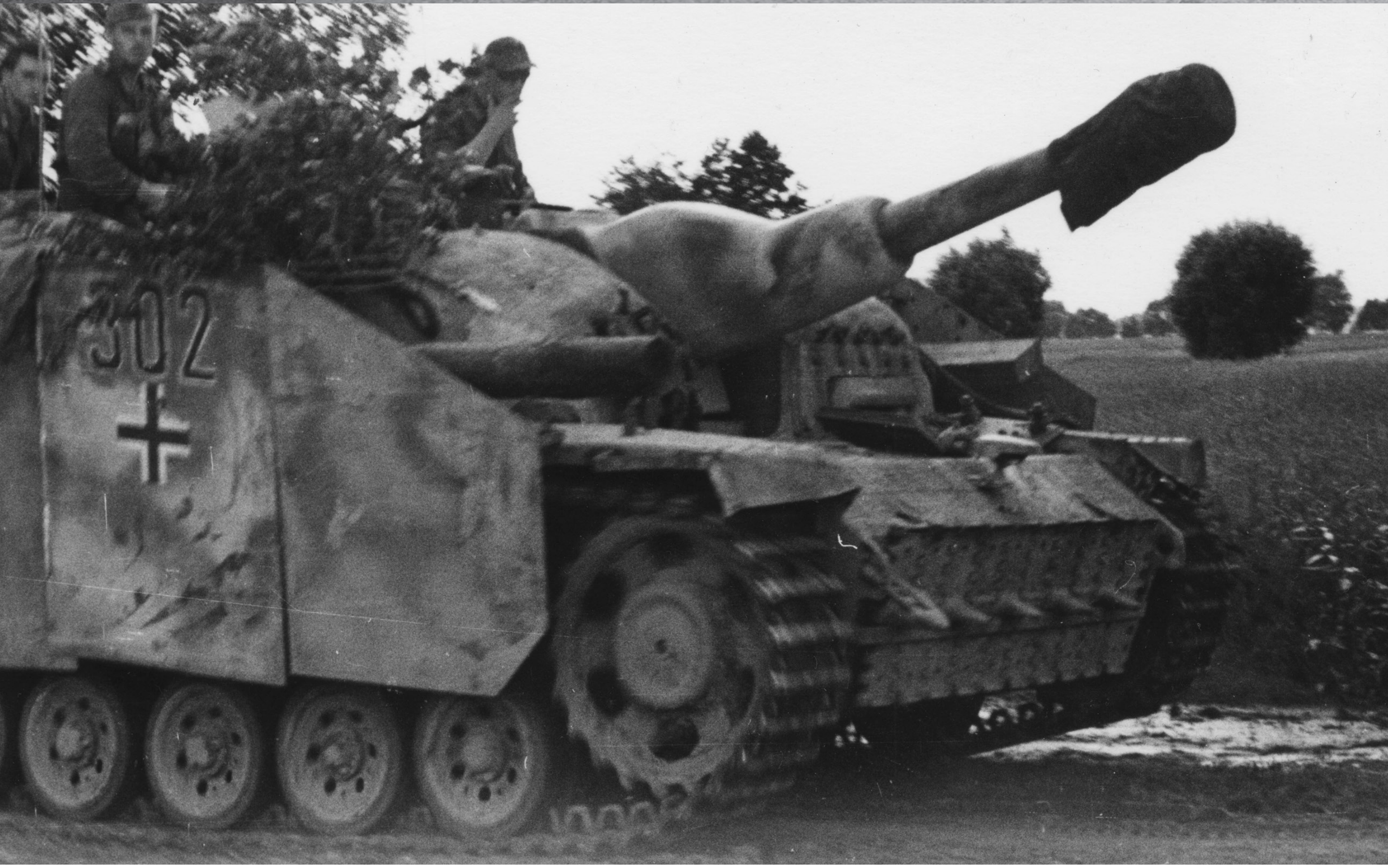
> It is impossible to fully re-equip the Panzer units fighting in the east. The *Sturmgeschütz-Abteilungen* are threatened by the same problem. Establishing even more new units without sufficient replacements to maintain their strength makes no sense. Men will be hampered if they do not have the weapons to carry on the fighting. During the last six months in the east, 1,106 *Sturmgeschütz* were lost, but only 751 replacements were received. The missing 355 represent the combat value of 12 *Sturmgeschütz-Brigaden*. If no provisions are to be made to compensate for these losses, the *Sturmgeschütz-Brigaden* will soon become as weak as a *Panzer-Abteilungen*. A minimum monthly supply of 300 *Sturmgeschütz* will be necessary to compensate for the losses and to improve the state of the brigades.

However, if there were efforts to raise the number of units, they were tempered by *Generaloberst* Guderian. In August 1944, he issued new rules:

> In a first oral report… it was determined:
>
> 1.) The number of StuG-Brigades will be limited to 45. Those brigades which were subordinated longer-term under larger units (177, 189, GD and 270) will be transferred to the *Panzerjägerwaffe*, or disbanded (the annihilated Brigade 245) or re-armed (281 to anti-tank artillery).



Oberwachtmeister (ObW – staff sergeant) Haussels of HStuGBrig 912 standing in the hatch of a *Sturmgeschütz* in August 1944. It was possible for the commander to use the *Scherenfernrohr* with the hatch closed. The vehicle is fitted with the rotating cupola which allowed an excellent view of the battlefront. However, many *Sturmgeschutz* were delivered with fixed cupolas due to a severe shortage of ball bearings. (StuArt Archive)



Sturmhaubitze of HStuGBrig 177 on a dirt track: The nose-heaviness of the vehicle has caused the front shock absorbers to fully compress. Note that parts of the superstructure have been filled with concrete and that track links from a Soviet T-34 have been added to the front. (Bose)

2.) Brigades 395 to 398 will not be established.
3.) The raising to 45 *Sturmgeschütz* in each brigade and the assignment of escort units will be granted approval but only in principle.
4.) The remaining 45 Brigades will remain with the artillery.
5.) A closer cooperation between *Sturmartillerie* and *Panzerjäger* has to be sought.

Improvements

The development and introduction into service of the PzKpfw V Panther and to a lesser extent the '*Neue Sturmgeschütz*' made clear that the technical concept of a sPaK, the *Sturmgeschütz* on the PzKpfw III chassis, had reached its limits. Nor was it possible to mount a higher-velocity or larger-calibre weapon, or improve armour protection. However, the inability of Germany's armaments industry to provide the *Sturmartillerie* with modern vehicles forced the continuation of the *Sturmgeschütz* III Ausf G. Indeed, both MIAG and Alkett continued to manufacture the type up until April 1945.

Mobility

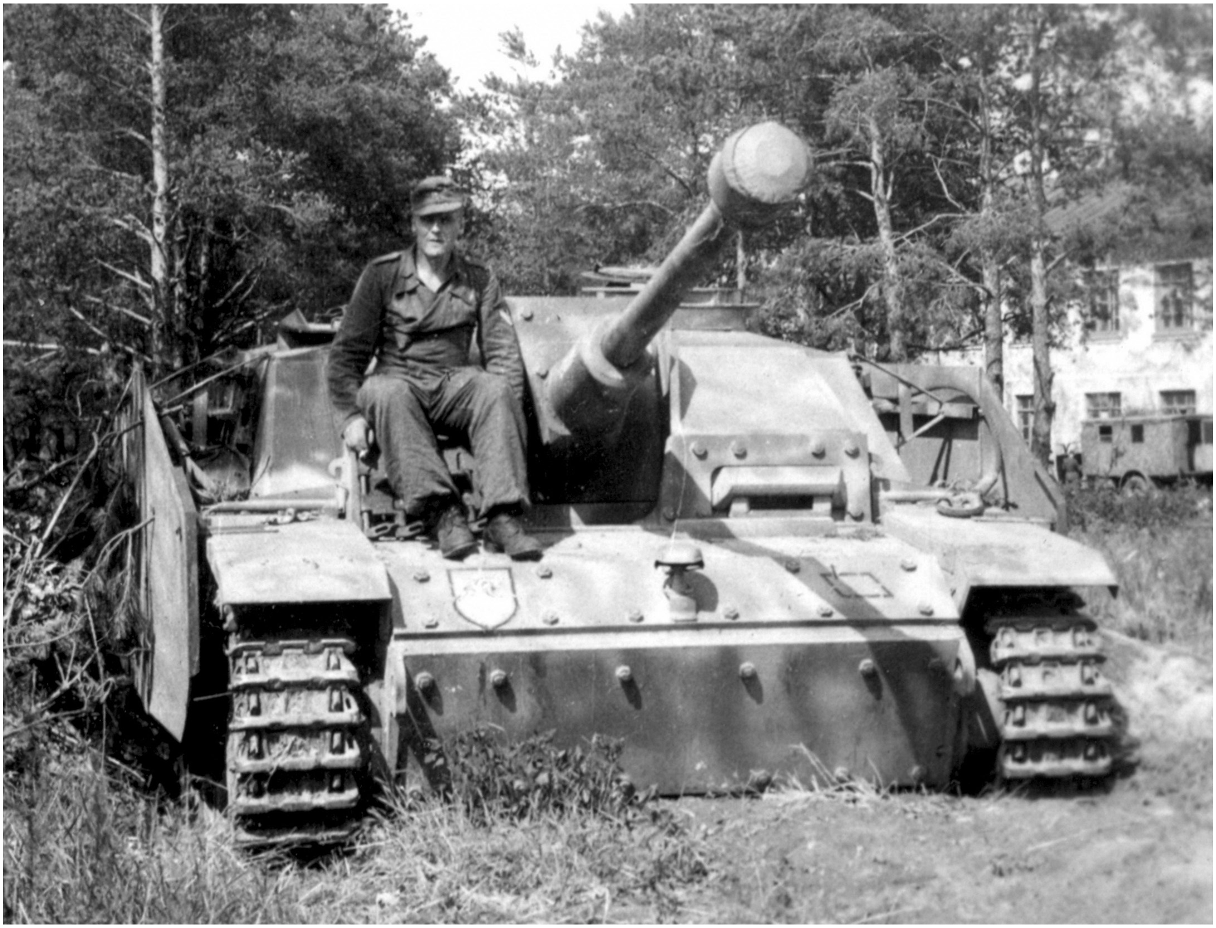
In 1944, a new type of widened track, O*stkette* (east track), became available. Unlike the earlier type, *Winterkette* (winter track), the individual links were stronger and avoided the use of extensions which easily broke off.

While mobility was improved over soft or snow-covered ground, steering became a problem. Also, the new tracks caused significantly more failures to the susceptible final-drive sprockets. Although they were scheduled to be delivered to all combat units in the east, problems with manufacture and supply did not make this possible.

Armour Protection

The frontal armour on the *Sturmgeschütz* remained at 80mm thick and the roof plates were a dangerously thin 10mm. Many units reported that plunging fire from a Soviet 120mm grenade launcher could cause serious damage, and that similar fire from artillery could easily penetrate the armour. But there was no simple remedy. The box-shaped gun mantlet was changed to a smooth casting known as the *Saukopf*, as it resembled a pig's head.

Side skirts (*Schürzen*) had been standard equipment since mid-1943, but had suffered from a number of problems, mainly with the mounting brackets. Although modified brackets were supplied, these were made even more robust by the front-line engineers.



A *Sturmgeschütz* Ausf G of HStuGBrig 190, in the summer of 1944, during the fighting in the east. The lion emblem of the unit has been painted on the front slope, along with the tactical marking for an assault gun. The vehicle appears to have been newly delivered as it has an intact set of *Panzerschürzen* and no other 'in the field' modifications. (Anderson)

Main Gun

From 1944, the 7.5cm *Sturmkanone* 40 was the main weapon for the *Sturmgeschütz*, essentially for combat against enemy tanks and it could be manufactured and mounted without modification. The 7.5cm PzGrPatr 39 remained as the most used anti-tank round. Smaller numbers of 7.5cm PzGrPatr 40 were available due to the difficulties with the supply of tungsten. Significant numbers of the 7.5cm PzGrPatr 38 HL (HEAT) round were also used (see table).

Ammunition	April 44	May 44	June 44	July 44	August 44	September 44	October 44
PzGrPatr 39	44,800	25,200	96,900	165,000	335,000	62,000	82,000
PzGrPatr 40	4,300	700	2,200	6,000	69,000	13,000	12,000
PzGrPatr 38 HL	23,700	9,100	33,300	68,000	38,000	56,000	7,000

The 10.5cm *Sturmhaubitze* (assault howitzer) 42 had proven to be a most versatile weapon.

From the transcript of meeting between the *General der Artillerie* and the commander of the *Sturmgeschütz-Schule* at Burg, dated 11 November 1944:

> Number of *Kanone* to *Haubitze*.
> A ratio of seven *Sturmkanonen* to three *Sturmhaubitzen* has proven successful. The usage of only *Sturmhaubitzen* is not advisable; a mixed platoon of two *Sturmkanonen* to one *Sturmhaubitze* is better.

The 10.5cm *Sturmhaubitze* 42 was originally fitted with a double-baffle muzzle brake which allowed the use of a stronger propellant charge. But since the charges were seldom used in battle, the muzzle brake was not fitted on production models from September 1944 onwards.

The gun fired a 10.5cm Gr 39 (HEAT) round, with a propellant charge, when fighting enemy tanks. In July 1944, an integral charge and propellant (cartridge) round, the 10.5cm GrPatr HL/C (HEAT) was introduced. This round required less stowage space inside the vehicle, it was quicker to load and allowed a more rapid rate of fire.

Left: The crew of this *Sturmgeschütz* Ausf G of HStuGBrig 202 has named it '*Sperber*' (sparrow hawk). The vehicle is passing a *Panzerzerstör-Trupp* (tank destruction team) armed with a *Raketenpanzerbüchse* (RakPzB) 54/1, also known by the troops as *Ofenrohr* (stove pipe) and *Panzerschreck* (tank shock). HStuGBrig 202 had their own way of modifying their vehicles; the front of the chassis has been reinforced with engine covers, possibly removed from wrecked assault guns. (Anderson)

Close-defence Weapons

The lack of a close-defence weapon on the *Sturmgeschütz* led to many losses of dedicated anti-tank infantry and was a constant point for discussion. To overcome the problem, a machine-gun mounting with a collapsible shield was positioned in front of the gun loader's hatch. Although it would now be possible to fight infantry directly ahead, the gunner remained exposed to fire from the side and rear. To improve matters, in mid-1944 the *Rundumfeuer* (remote-controlled machine gun) which allowed all-round fire was developed for the '*Neue Sturmgeschütz*'. Although a significant improvement, Germany industry was unable to manufacture sufficient numbers to fit on all vehicles in service.

In autumn 1944, the *Nahverteidigungswaffe* (close-defence weapon) began to be fitted in the roof panels of the *Sturmgeschütz*. The weapon was a simple launcher designed to fire smoke (to conceal) or shrapnel (against anti-tank infantry) grenades.

Ant-aircraft Defence for *Sturmgeschütz* Units

After the defeat of *Panzerarmee Afrika* in Tunisia the German military leadership had to realize not only that the *Luftwaffe* had lost air supremacy, but that their own *Panzertruppen* had become prime targets for strafing enemy fighter bombers. The development of anti-aircraft tanks was begun.

In a memorandum dated 31 May 1943, the *General der Luftwaffe* (FlaK) reported:

> 1.) *Selbstfahrlafette* for light FlaK:
>
> The *Panzertruppe* demands an anti-aircraft escort for tanks.

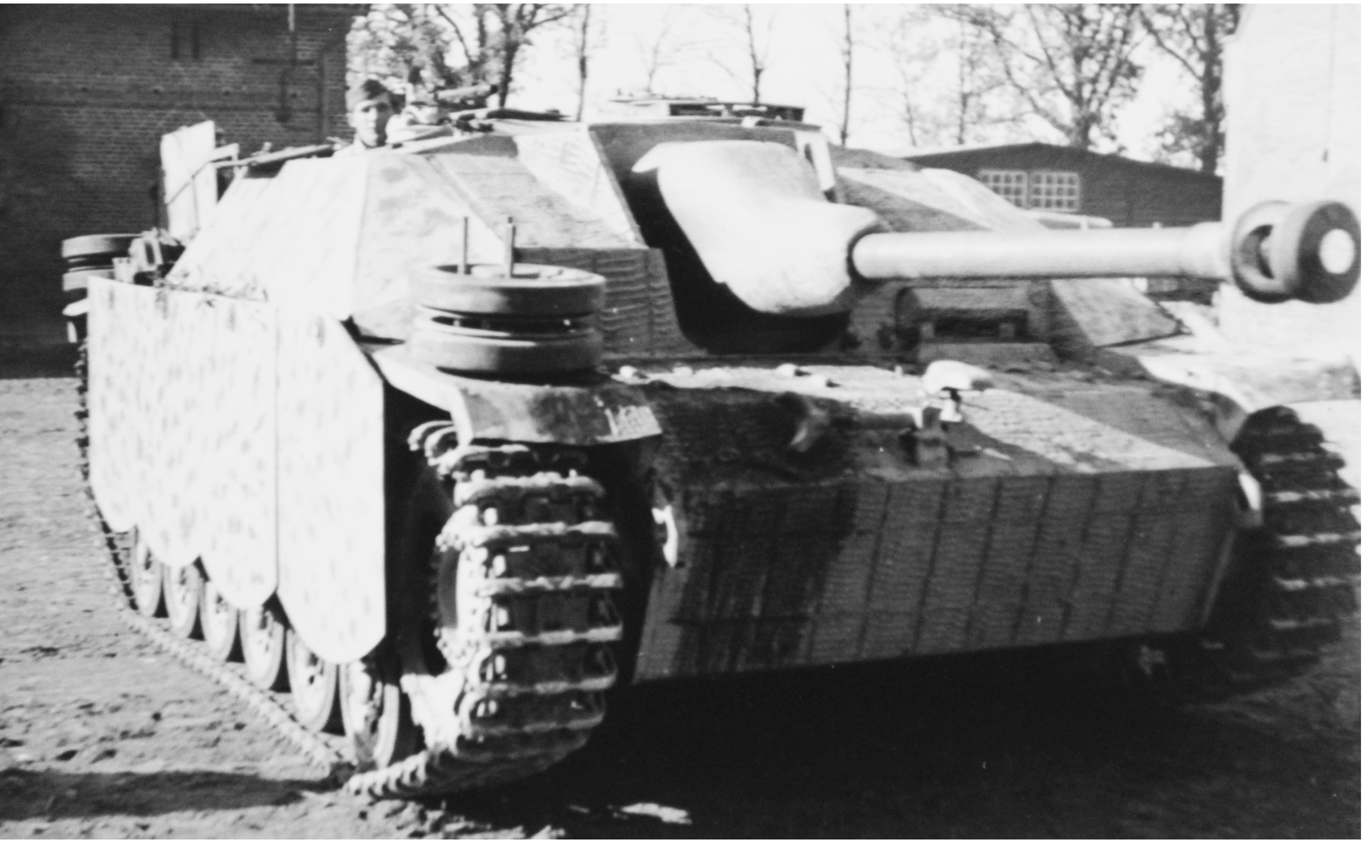
The commander of a *Sturmgeschütz* from StuGBrig 270 passes instructions to the escorting grenadiers. He is wearing a throat-type microphone and earphones to make contact with the battery commander or listen to radio traffic. The loader, also wearing earphones, has mounted a *Maschinengewehr* 42 for close defence in place of the standard MG 34. (Anderson)

> Ordnance available:
> The 2cm *Vierling* (quadruple mounting), or 3.7cm *Zwilling* (twin mounting) and possibly a 5.5cm.
>
> Carrier vehicle:
> A Panzer IV with modified superstructure and foldable gun-platform sides. *General der Luftwaffe* (FlaK) requests an examination and development of a new design. The development of a sample is requested with some urgency.

The matter was further discussed during a *Führerkonferenz* on 17 June 1943:

> The *Führer* has decided:
>
> 7.) With regard to the increased danger of air raids, the *Führer* agrees on the creation of *Flakpanzer* vehicles as soon as possible. These tanks shall be built on the Panzer IV chassis but with an improved engine.

At approximately the same time, development work began at BMM on a light self-propelled FlaK gun using the chassis of the Panzer 38(t). Production started in November 1943, and a month later the



HStuGBrig 203 made many modifications to their *Sturmgeschütz* by using available material. The vehicle has been fitted with small flexible-mounted skirts and extra sloped armour welded on the superstructure. The vehicle would usually carry a *Rundumfeuer-Maschinengewehr* 34, but the gun and armoured shield are not fitted. (Beraud)

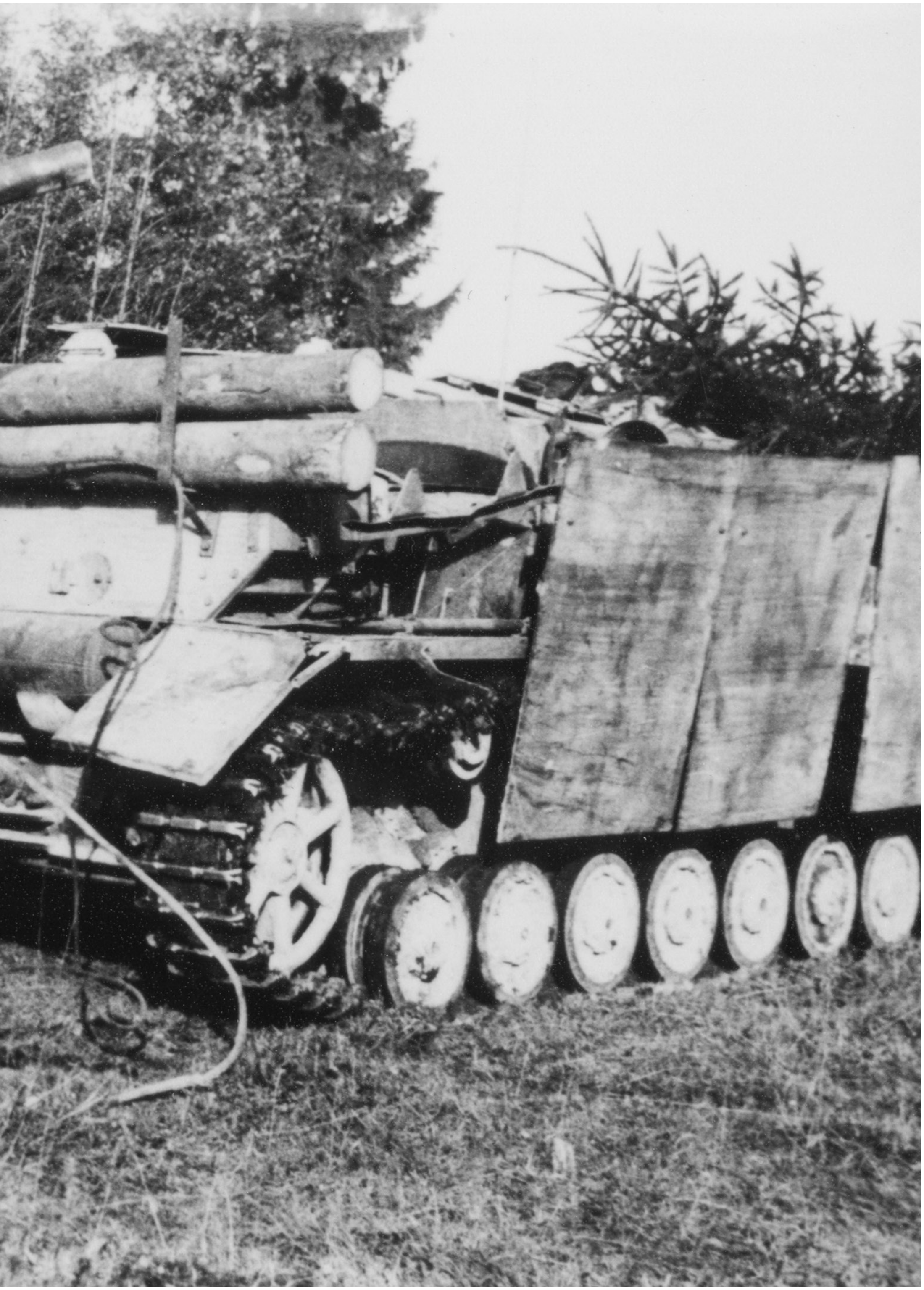
Organisationsabteilung suggested that the *Flakpanzer* 38(t) be incorporated into *Sturmartillerie* units:

> It is proposed to provide for a *Sturmgeschütz-Abteilung*:
>
> One FlakPzBttr with 14 *FlakPanzer* 38(t).
> One StuGBeglBttr with three platoons.
> No problems are expected with leadership and supply.

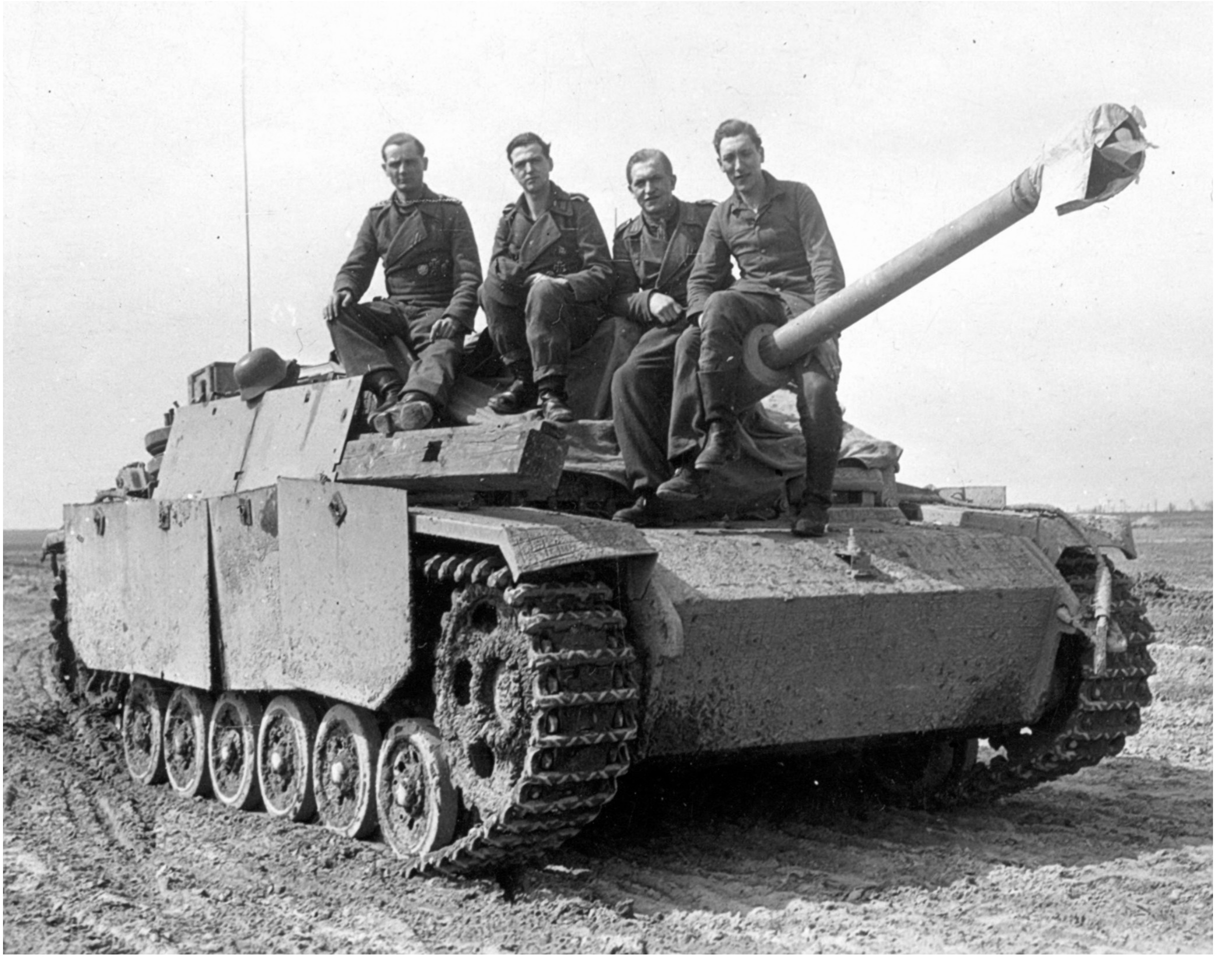
Although the report ends with the confirmation that three proven StuGAbts in the east could be issued with *Flakpanzer* 38(t) (and the StuGBeglBttr), this did not happen. The *General der Artillerie* reported in February 1944:

> 1.) Equipment of *FlakPanzer* batteries of *Sturmgeschütz Abteilungen* will not take place with PzKpfw 38(t), but with PzKpfw II, since the 38(t) tanks are scheduled to be issued to replacement tank units in the west.

This report would also turn out to be unfeasible. While the *Panzertruppe* would be issued with 3.7cm-armed *Flakpanzer* beginning in March 1944, the artillery was for the moment forgotten.



The *Sturmgeschütz* IV was normally only issued to *Panzerjäger-Kompanien*, but HStuGBrig 177 was an exception. The unit received (or commandeered) one of the type in 1944, which was (it is thought) used by the commander. Here the vehicle is being used to recover a captured Russian SU-85 tank destroyer. (Historyfacts)



HStuGBrg 190 did its best to improve their *Sturmgeschütz*; the *Panzerschürzen* here have been fitted on flexible mountings by the unit's engineers. The vehicle was manufactured by MIAG, as identified by the '*Zimmerit*' which has been applied in a pattern of small squares. Note that the running gear is completely coated in mud which made regular maintenance very difficult. (Anderson)

These first vehicles, commonly known as *Möbelwagen* (furniture van) because of their box-like appearance, were relative simple conversions. A platform was fitted on a PzKpfw IV hull and a 3.7cm FlaK 43 was mounted without further modifications. During transport the gun and its crew were protected by large steel plates. In combat these were folded down to allow the gun to be traversed, but left the crew unprotected.

The anti-aircraft tanks became available in mid-1944, but were far from being ideal. The *Flakpanzer* 38(t) had only limited firepower, and production ceased in February 1944. The 3.7cm FlaK 43-armed *Möbelwagen* was better, but the gun had a moderate rate of fire: not the best weapon to destroy low-flying aircraft.

The first 'true' *Flakpanzer* was the result of a more unconventional approach. Ignoring the normal protocol, whereby a commercial company would have been contracted for the design and production, instead a military unit was selected. PzErsAbt 15 at Sagan, Silesia, was ordered to create facilities for the production of a *Flakpanzer* with a fully-rotating open-topped turret on a PzKpfw IV chassis. It was to mount the 2cm *Flakvierling*

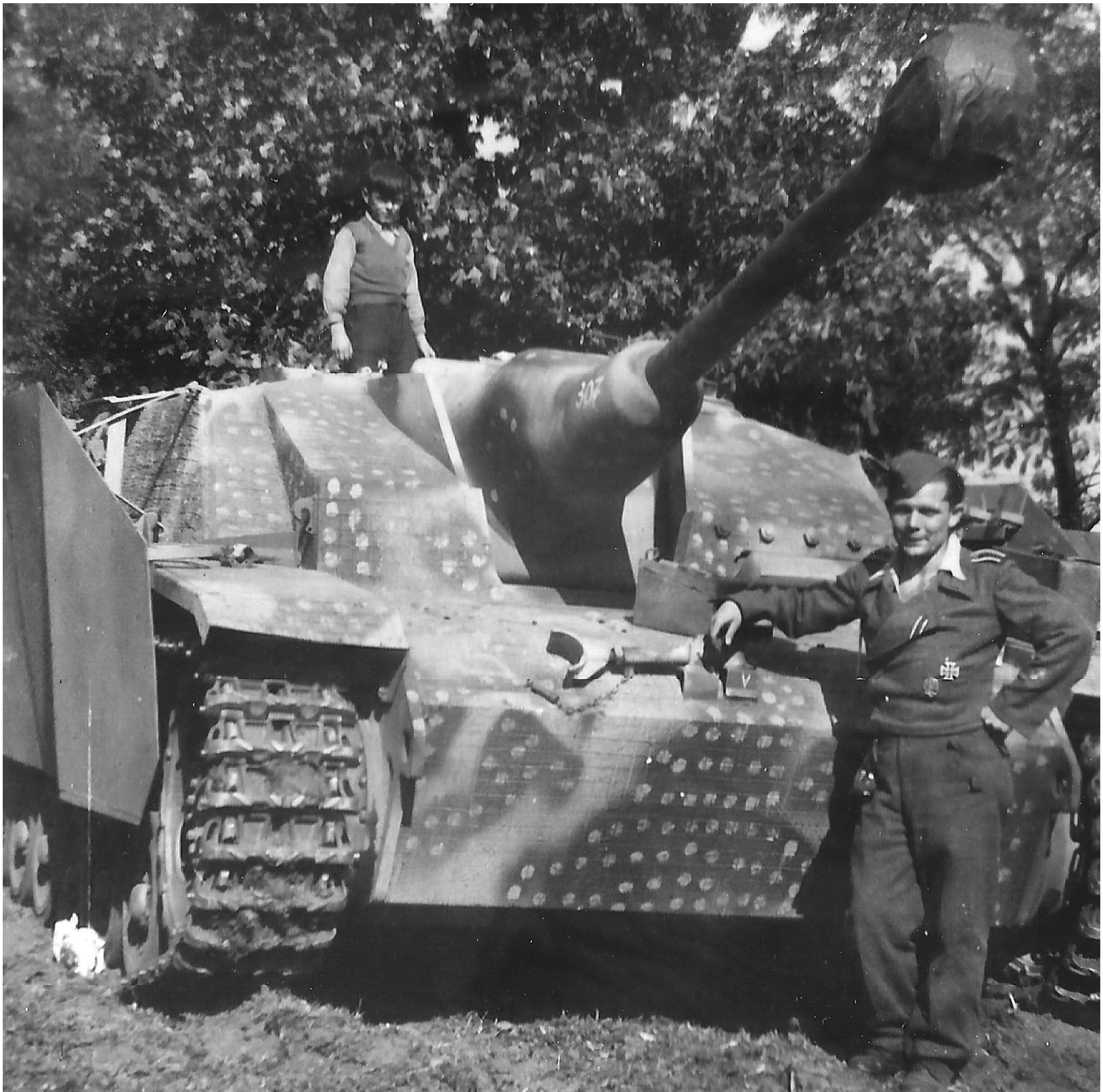
38, and be ready for production by July 1944. In service it became known as the '*Wirbelwind*'. Later, a similar vehicle armed with a single 3.7cm FlaK 43 L/60, known as '*Ostwind*' (east wind), entered service.

The office of *General der Artillerie* was very unhappy.

On 16 December 1944, *Oberstleutnant* Haarberg, a *Sturmartillerie* staff officer, submitted a report on his visit to the *Sturmgeschütz-Schule* at Burg.

> 2.) *Flakpanzer:*
>
> The matter is progressing too slowly. *Oberst* Schade has sent a PzKpfw III hull and two quadruple gun mountings to Sagan. Sole purpose: Construction of an experimental *Flakpanzer* III.

A newly delivered *Sturmgeschütz* Ausf G of StuGErs u AusbAbt 200 is painted in *Licht und Schatten Tarnung* (light and shade camouflage), usually known as the 'ambush scheme'. The vehicle's number '307' has been painted on the gun mantlet). (Anderson)



> *Herr* Beckerr, a government official, was ordered to travel to Ostbau Sagan to supervise this work. Ostbau Sagan turned out to be a vehicle repair facility, where a number of PzIV hulls were being reworked to *Flakpanzer* by very simple means under the command of a *Panzerwaffe Leutnant*. The latter regarded it as impossible to rework the Panzer III. Becker returned without having achieved anything.
>
> The school hereby commissions:
> A facility similar to Ostbau Sagan shall be established at Burg. All necessary means are to be made available. The construction of the *Flakpanzer* III will be performed by the school. To accomplish these tasks, the following will have to be delivered as soon as possible:
>
> PzKpfw III chassis from Sagan to Burg
> A second test hull
> Two quadruple mountings
> Two 3.7cm guns
> One complete turret for a 3.7cm gun with all associated material
> One complete turret for a quadruple gun with all associated material
> This proposal seems to be achievable by all means.

Left: A late production *Sturmgeschütz* Ausf G bogged down in marshy terrain. The crew has attempted to reinforce the front amour by fitting lengths of track. Note a cast deflector has been welded to the cupola, one of many improvements introduced during production. Note the aperture in the *Saukopfblende* (pig's head mantlet) for a coaxially-mounted machine gun. The vehicle mounts a *Rundumfeuer-Machinengewehr* 34. (Anderson)

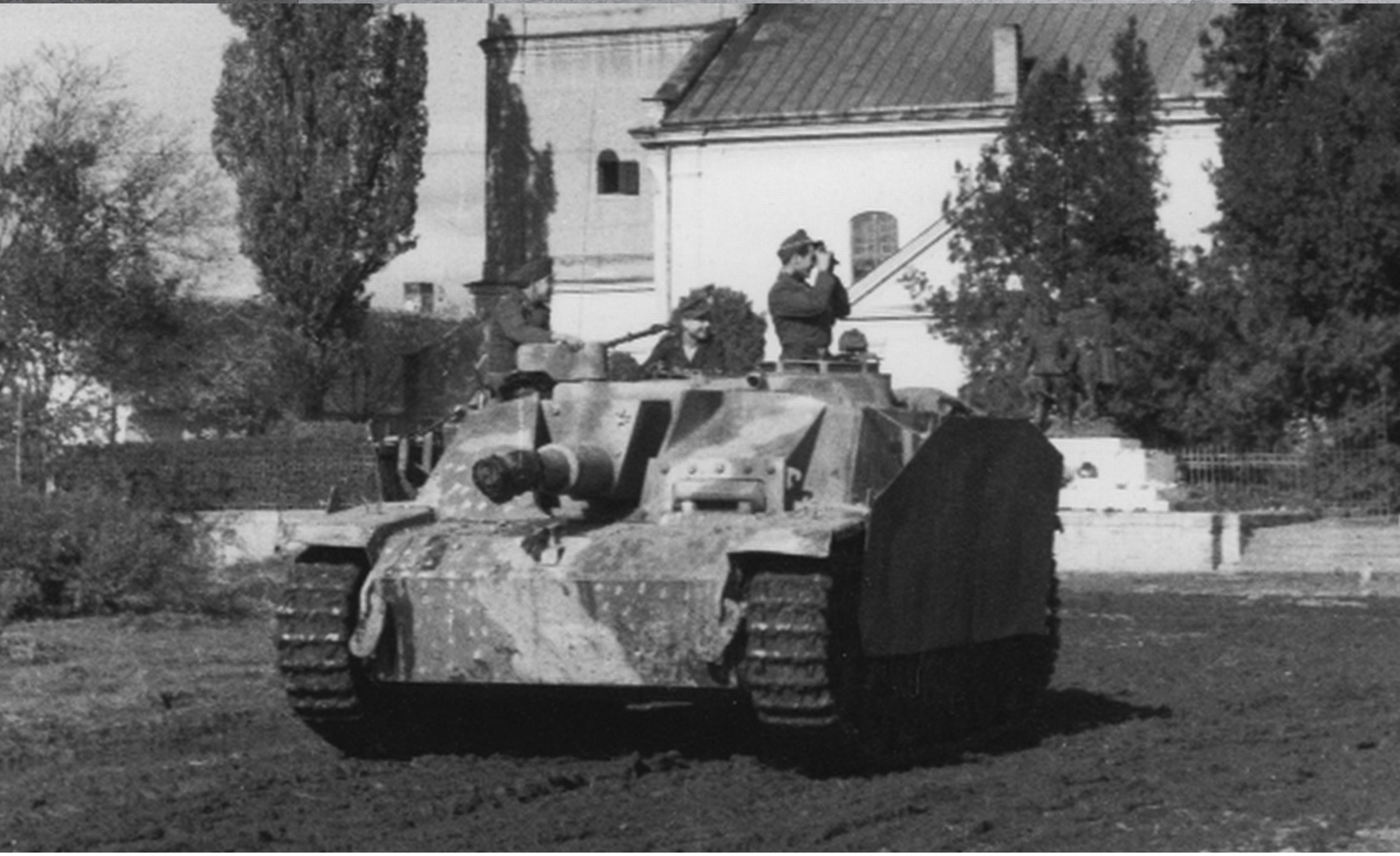
Three months later the situation had not improved. On 5 March 1945, the *Heereswaffenamt* tried to intervene in favour of the *General der Artillerie*:

> *General der Artillerie* demands *Flakpanzer* to protect *Sturmgeschütz* units against strafing aircraft. All previously produced *Flakpanzer* have been based on the PzKpfw IV. Examination executed by the *Sturmgeschütz-Schule* Burg showed that both the 2cm quadruple mounting and the 3.7cm gun can be mounted on the PzKpfw III chassis using an essentially unchanged hull.
>
> *General der Artillerie* also demands delivery of 90 devices [turrets, author], 18 can be diverted from *Ostwind* production. Another 72 will have to be produced… The chassis can be acquired from the artillery's stock of *Sturmgeschütz*, and the use of rebuilt chassis is also a possibility. Rebuilt hulls including all necessary bearings are still available. The availability of the required guns is also confirmed.

The question as to whether *Sturmgeschütz-Schul*e Burg did actually finally complete some *Flakpanzer* III cannot be answered.

Only a few *Sturmgeschütz* units are known to have been issued with *Flakpanzer*. In strength reports maintained by the *Generral der Panzertruppe* it seems that on 15 March 1945, StuGBrig 244 was reported to have one operational *Flakpanzer*s and one in short-term repair; StuGBrig 341 had two operational *Flakpanzer* and one in short-term repair.

The strength report, dated 10 April 1945, from *Oberbefelhshaber* (supreme commander) West mentions StuGBrig 667 [it should be



HStuGBrig 202 fought in the east until the end of World War II. A *Sturmhaubitze* from the unit still has a set of *Panzerschürzen* and appears to be in serviceable condition. It is a late production vehicle as indicated by the cast deflector on the cupola, and the *Rundumfeuer-Maschinengewehr* 34. The gun barrel does not have a muzzle brake as this was cancelled on production vehicles in September/ October 1944.

StuArtBrig 667, author]. In the report the unit shows its parlous, if interesting state:

StuGBrig 667	StuG III	StuG IV	*Flakpanzer*
Target	6	4	4
Operational	1		2
Short-term repair	3	1	1

The exact type of *Flakpanzer* cannot be determined. However, by early 1944 all three units fought in the Ardennes and in the Rhenish Pfalz. So it is possible that they received small numbers of *Flakpanzer* IV from PzErsAbt 204 (this was the standard procedure) which was located in nearby Schwetzingen. An allocation of *Flakpanzer* III from Burg seems to be unlikely.

Ultrarot-Geräte

In 1943, German engineers began the development of *ultra-rot* (infrared) equipment to enable tanks to fight in total darkness. The system worked by using an infrared ‘searchlight’ to emit beams which were then bounced back to receiver units for the driver (to see forward) and commander (to identify the target and range).

By 1944, the system had been sufficiently tested and was ready for production. The *General der Artillerie* was eager for the system to enter service, but despite his repeated demands this did not happen before the war ended.

The End

In the west, the *Sturmartillerie* was not only fighting a numerically superior enemy, who also held air superiority over the battlefront, but also the unsuitable terrain: the bocage countryside severely hampered *Sturmgeschütz* operations. Desperate measures were required and these included attacks at night, some of which resulted in a limited success.

A November 1944 after-action report from StuGBrig 902 reads:

> I. Assessment of the enemy:
> 2.) British troops:
> In general better than the American; the British are tough in combat, but is often unable to exploit local success, possibly due to the lack of initiative by the NCOs.
> 5.) Tanks and anti-tank weapons:
> The Churchill tank occasionally encountered is a serious opponent, and is in some aspects equal to our heavy tanks. Penetration of the frontal armour with the PzGr 39 proved to be impossible at medium ranges and it has a gun which is comparable to that of the *Sturmgeschütz*… We repeatedly encountered Churchill *Schaufelpanzer* (dozer) and *Flammenpanzer* (flamethrower) tanks. The morale value of these tanks was greater than their actual impact.
>
> II. Own troops:
> 3.) The terrain was unfavourable for the deployment of tanks, movement was possible only on roads… Two Sherman tanks were set on fire by our *Sturmgeschütz* using only few rounds of PzGr 39.

On 19 January 1945, *Oberstleutnant* Großkreutz, a *Panzerartillerie* officer, reported on his journey to the *Heeresgruppe* B, where he inspected StuGBrig 244 among other units during the Ardennes offensive:

> I. General:
> The terrain is hilly to mountainous with many, but narrow and winding roads. Some 50 per cent is forested. Snow situation: 20cm with drifts up to 1m… In German-held terrain all villages are heavily damaged, St Vith has been totally destroyed. Nearly all supplies have to be transported via truck from beyond the river Rhine. The greatest problem is the shortage of fuel, which impedes usage of otherwise operational tanks. Also, ammunition is scarce.
>
> II. Enemy:
> 1.) Infantry:
> The enemy had fought doggedly in defence, as long as his rear positions held. He is sensitive to night attacks. His infantry will make more use of its small

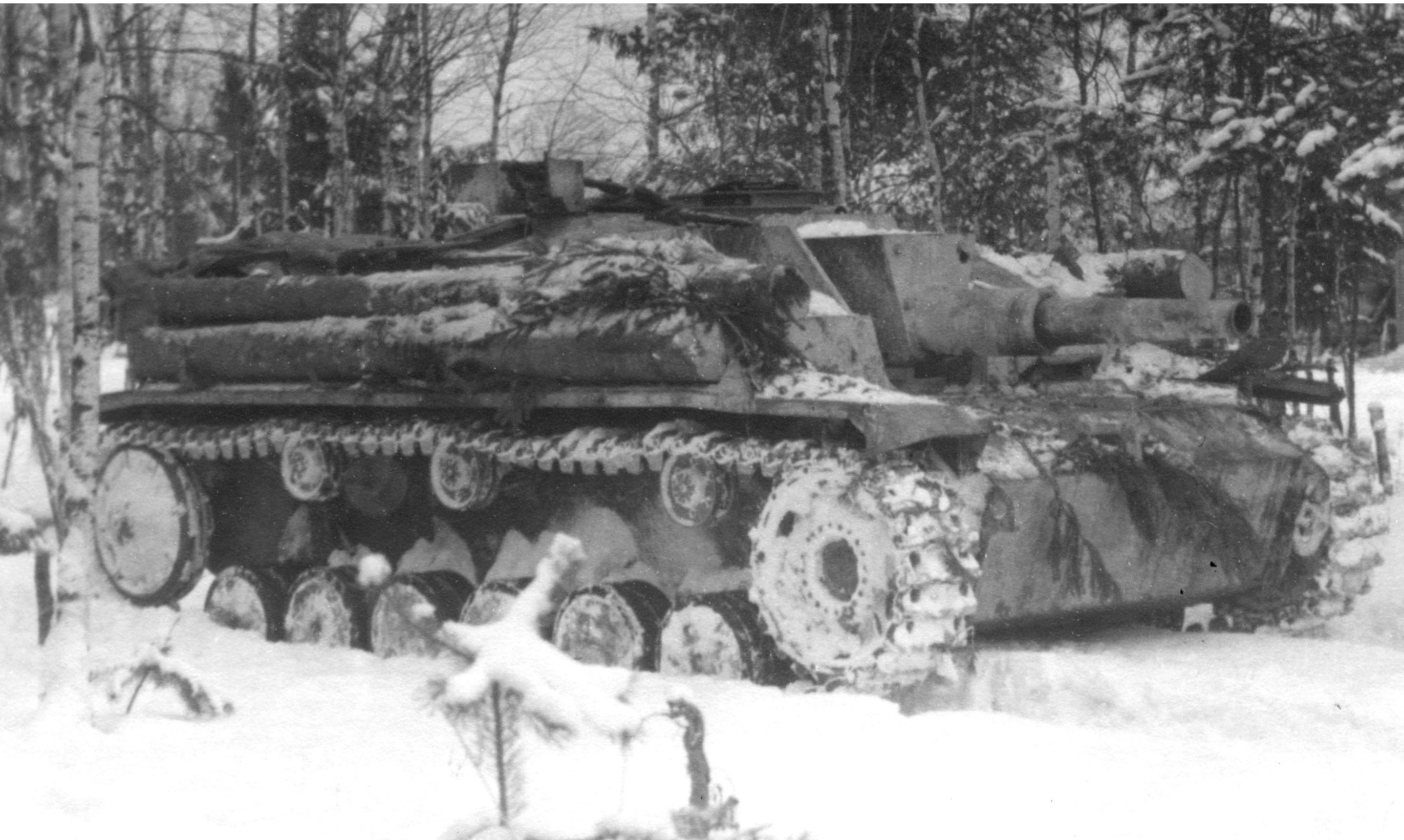
arms than our own infantry… Despite our surprise attacks the enemy's lower command level was effective and energetic. Our own troops underestimated the enemy's resistance.

2.) Tanks:
Heavy enemy tanks [possibly the Sherman M4A3E2 Jumbo, author], which were invulnerable to 7.5cm L/48 fire even at short ranges, have been reported already by HStuGBrig 244. As reported, at other places four were destroyed by PzKpfw VI Tigers. The enemy made effective use of mine-clearing tanks.

III. Own troops:
1.) General
The morale of our troops is very low, because they have been forced onto the defensive again. Especially the grenadiers, who have found it difficult to find cover, are seriously physically stressed.

2.) *Sturmartillerie*
The *Sturmartillerie* has proven its value also in the west, where it is the backbone of our infantry. Combat losses in personnel and material are high. A steady flow of supplies is necessary, but is always delayed in reaching our troops.

Night attacks have proven most effective. *Sturmgeschütz* were the first to enter St Vith at night. The enemy, who until then had put up a dogged defence, gave up the struggle for the city and retreated. In Krombach, southwest of St


A late-model *Sturmhaubitze* from an unidentified unit: The crew has placed thick tree trunks on the track guards, in a desperate attempt to improve protection. A *Rundumfeuer-Maschinengewehr* 34 is mounted on the roof and a co-axial machine gun is mounted in the gun mantlet. (PeKo)

> Vith, seven *Sturmgeschütz* succeeded in taking the city, which was defended by 30 tanks, in a night attack. The enemy lost 15 tanks; many of which were lightly damaged. Both attacks were carried out in bright moonlight.
>
> Desired armaments:
> One third of the guns should be L/70, one third L/48, and one third *Haubitzen* [howitzers].
>
> *Grenadier-Begleit-Zug*
> These platoons have proven most successful in the west also…

The superiority of the western allies in men and equipment, backed by almost total air superiority, was overwhelming. Tactics such as night attacks resulted in some limited, localized successes.

The East – Facing the 'Josef Stalin'

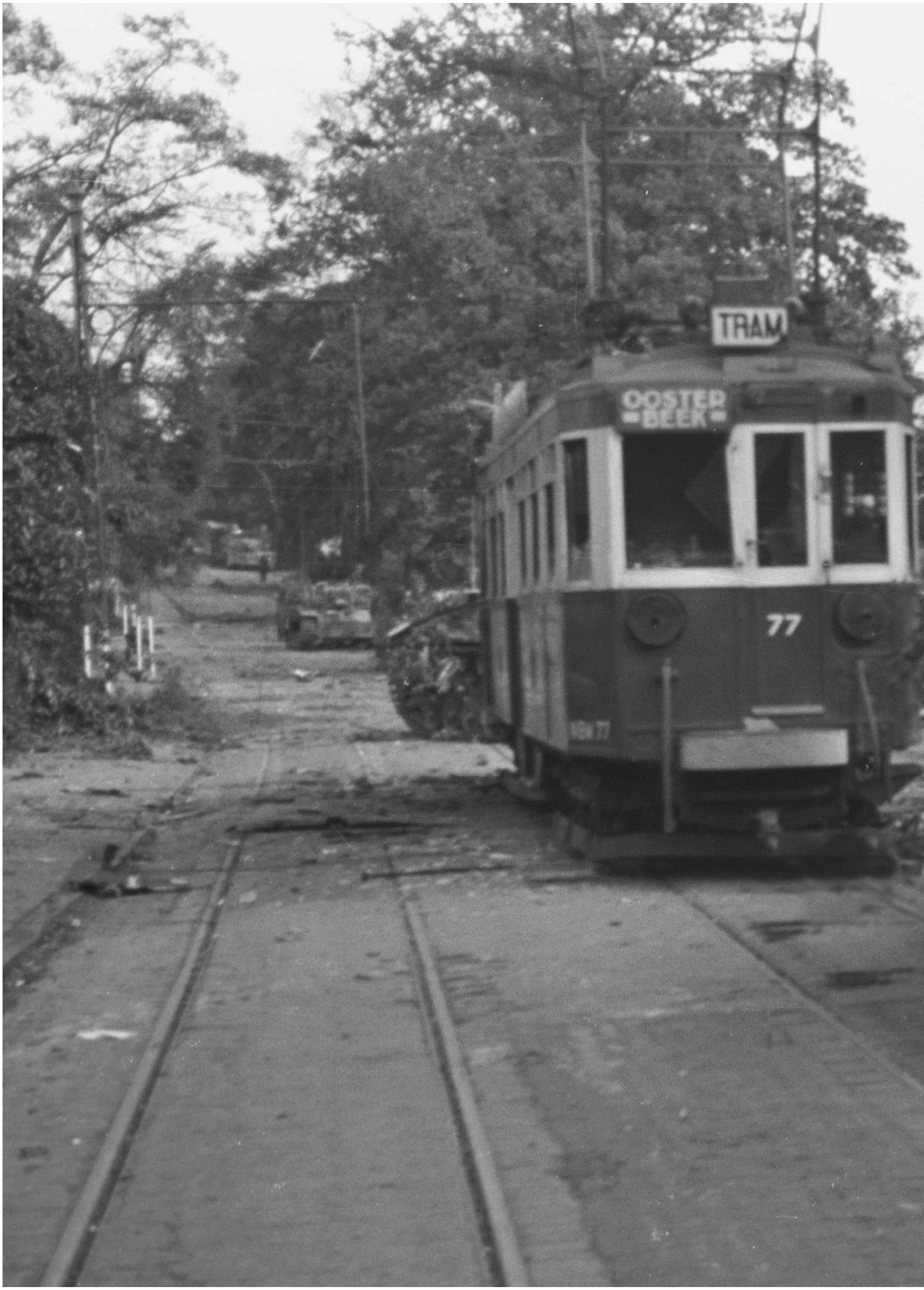
By the end of 1944, the T-34/85 had begun entering service in growing numbers, and would alter the balance of power considerably. Without impeding the tank´s mobility, the Russians had succeeded in mounting a far more powerful gun and increasing the armour protection of the cast turret. In combat the 85mm ZiS-S-53 gun had a longer destructive range than the *Sturmkanone* and was deadly against a *Sturmgeschütz*. However, by making use of better combat tactics *Sturmgeschütz* crews were able to cope with this challenge.

The introduction of the IS-2 (*Josef Stalin* – Joseph Stalin) made life very dangerous for all German armoured units. The new type was almost a completely re-designed KV-85, continuing the principle of the heavily-armoured break-through tank. Frontal armour was more than 120mm thick, and the turret and hull sides were 90mm thick. A *Sturmgeschütz* could fight at ranges up to 500m, but the 122mm A-19 gun on the IS-2 tank proved to be deadly at all combat ranges.

But a *Sturmgeschütz* could not avoid combat. In the '*Nachrichtenblatt der Panzertruppen*' bulletin refined combat tactics were deemed necessary, as an after-action report from a non-specified *Sturmgeschütz* unit proves:

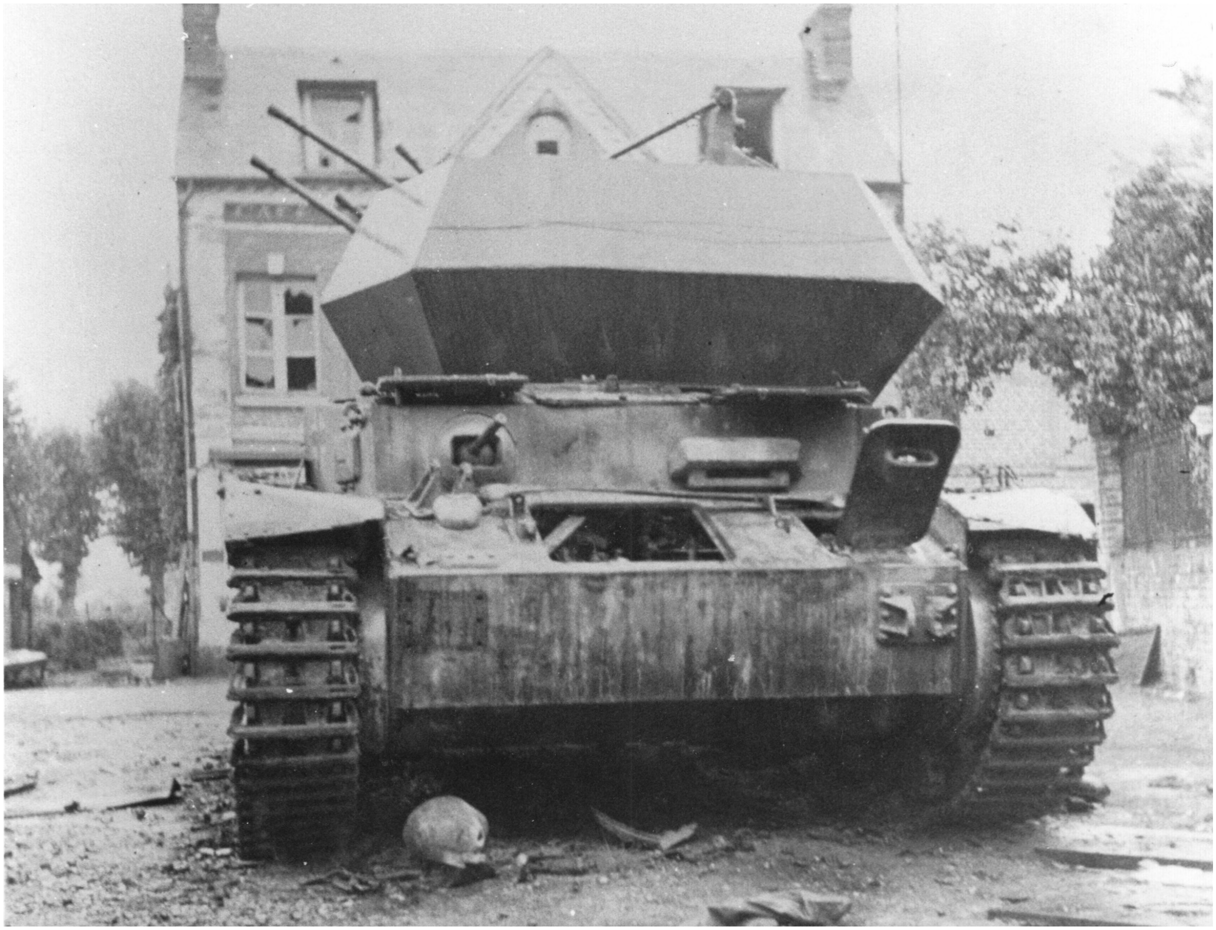
> The company had been ordered to hold an important place with the division's reconnaissance battalion. After the Bolsheviks had tried to take the place three times unsuccessfully, they launched a fourth attack after heavy artillery preparatory fire. Two 'Josef Stalin' supported by the remaining four T-34s attacked. The enemy tanks took advantage of the smoke from the burning village for their advance. As the smoke cleared, the two 'Josef Stalin' lay 300 to 400m in front of our *Sturmgeschütz* near some wrecked T-34s. When they lost the cover of the smoke, they turned away. During this manoeuvre all tanks were destroyed within ten minutes, one 'osef Stalin' by a hit penetrating the left side of the turret, the other by a hit on the turret rear.

During the course of Operation *Market Garden*, the airborne landings around the city of Arnhem (17 September to 24 September 1944), German units put up an unexpectedly strong resistance. One of the units involved was HStuGBrig 280 and three *Sturmgeschütz* from the unit moved up to take positions along a tram line to the front line. (PeKo)



Strength reports *Sturmgeschütz-Brigades* as of 1 September 1944

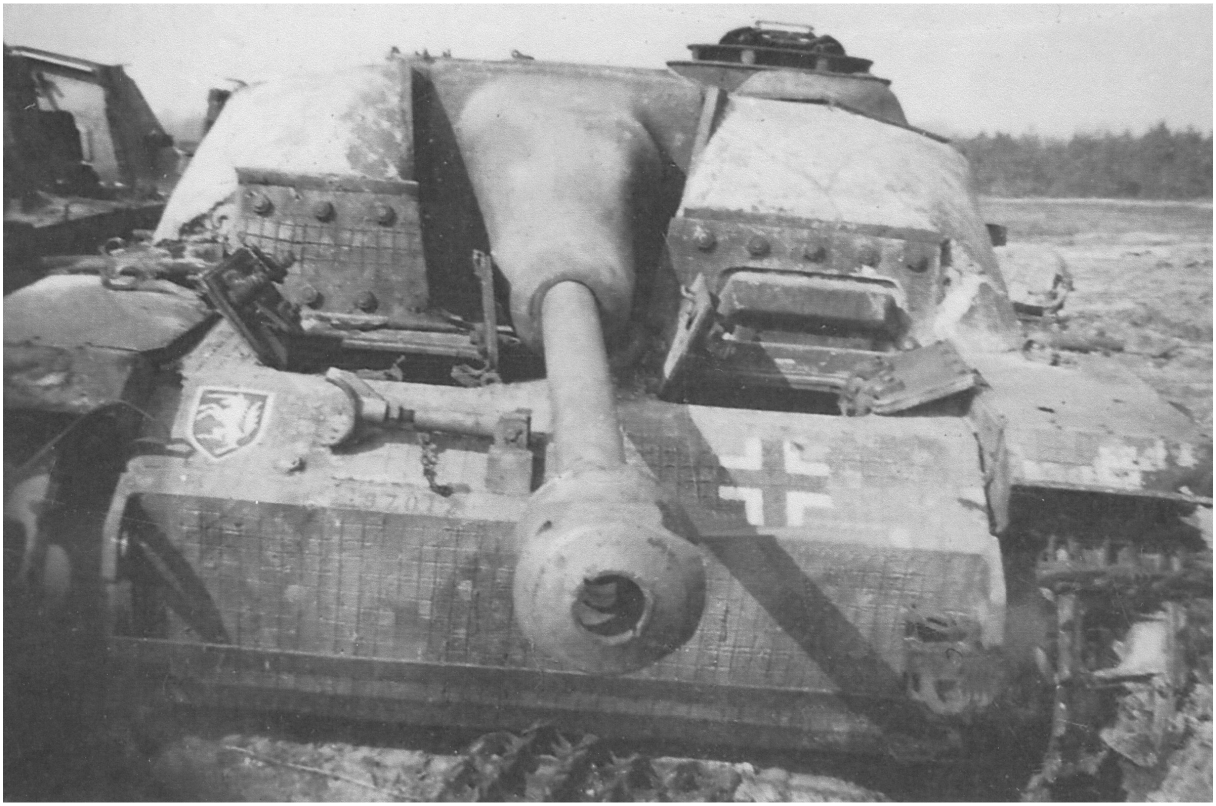
Army Group	Brigade	Target		Operational			In Repair		
		7.5cm	10.5cm	7.5 *kurz*	7.5cm	10.5cm	7.5 *kurz*	7.5cm	10.5cm
HG Südukraine	228	22	9	0	0	0	0	0	0
	236	22	9	0	0	0	0	0	0
	239	22	9	0	8	4	0	0	0
	243	22	9	0	0	0	0	0	0
	278	22	9	0	0	0	0	0	0
	286	22	9	0	26	0	0	0	0
	325	22	9	0	0	0	0	0	0
	905	22	9	0	0	0	0	0	0
	911	22	9	0	0	0	0	0	0
HG Nordukraine	201	22	9	0	3	2	0	20	4
	210	22	9	0	13	6	0	13	2
	249	22	9	0	0	4	0	2	4
	300	22	9	0	14	0	0	9	1
	301	22	9	0	3	2	0	0	0
	311	22	9	0	1	6	0	17	3
	322	22	9	0	8	4	0	9	6
HG Mitte	185	22	9	0	13	3	0	3	5
	190	22	9	0	22	4	0	2	1
	203	22	9	0	14	6	0	6	2
	209	22	9	0	9	11	0	4	1
	232	22	9	0	18	7	0	6	2
	259	33	12	0	29	8	0	0	1
	276	22	9	0	11	8	0	5	2
	277	22	9	0	16	7	0	2	1
	279	22	9	0	20	5	0	2	2
	904	22	9	0	14	4	0	7	1
	920	22	9	12	13	4	2	1	2
	GD	22	9	0	10	0	0	13	2
	Burg	7	3	0	7	0	0	2	0
HG Nord	184	22	9	1	4	6	0	11	5
	202	22	9	0	14	4	0	4	3
	226	22	9	1	15	1	0	7	0
	261	22	9	0	11	10	0	4	2
	303	33	12	0	28	6	0	9	1
	393	22	9	0	16	9	0	3	1
	2./909	7	3	0	6	0	0	0	1
	912	22	9	0	17	4	0	12	2
Denmark	280	22	9	0	0	0	0	0	0
	ErsAbt 400	22	9	22	7	0	4	0	0
OB West	341	33	12	0	12	0	0	0	0
	394	22	9	0	0	0	0	0	0
	902	22	9	0	6	0	0	0	0
HG C	242	22	9	0	8	0	0	2	4
	907	22	9	0	19	4	0	8	3
	914	22	9	0	0	6	0	0	3
HG F	191	29	12	0	7	3	0	0	0
Ersatzheer, brigades to be replenished	244	22	9	0	0	0	0	0	0
	600	22	9	0	0	0	0	0	0
	667	22	9	0	0	0	0	0	0
	909	22	9	0	0	0	0	0	0
Totals		**1110**	**450**	**36**	**442**	**148**	**6**	**183**	**67**



Only a few *Sturmartillerie* units received anti-aircraft tanks to provide protection against strafing attacks by enemy aircraft. In April 1945, HStuArtBrig 667 had four in its inventory and it is most probable that these were standard production '*Wirbelwind*' built on a PzKpfw IV chassis. (NARA)

The next day the Russians attacked with infantry, this time two 'Josef Stalin' were held back in positions 2,000m distance to support their troops. The attack was repulsed. Our *Sturmgeschütz* were not hit, since they constantly changed position.

At dawn on the next day, the Russians attacked, from the north, with three 'Josef Stalin' with mounted infantry, without any preparatory fire. Since the 'Josef Stalin' had been already spotted, the company was grouped in a way that the enemy tanks would run into a fire trap… The attack aimed at the centre of the village, where two *Sturmgeschütz* had taken position. At a range of 300m an anti-tank gun of the reconnaissance battalions opened fire. Despite achieving a clear hit, the round did not penetrate. The Soviet crew left the tank immediately. By advancing, one of the *Sturmgeschütz* reached a favourable position and obtained two hits shearing off the commander's cupola of the abandoned tank, setting it on fire. The remaining 'Josef Stalin' turned away without firing. During the evening they moved into positions some 700m distant, opening fire at the anti-tank gun. In the meantime, two



This *Sturmgeschütz* Ausf G of HStuArtBrig 667, the *Einhorn* (unicorn) Brigade, was all but destroyed during fighting on the western front and their surviving vehicles were gathered together in a yard. The unicorn badge of HStuArtBrig 667 has been painted on the front plate. Note the distinctive MIAG-style 'Zimmerit' coating. (Anderson)

> *Sturmgeschütz* had reached favourable positions and opened fire from the flank of the 'Josef Stalin' at ranges of approximately 600m. After firing four rounds, the first tank was hit on the side of the turret, setting it on fire. The crew did not get out. When the second "Josef Stalin" was hit without penetration, the crew abandoned the tank. After three rounds a penetration on the left turret side was achieved, setting the tank on fire which caused an explosion.
>
> During these three days the company which held the village with six *Sturmgeschütz*, destroyed nine T-34 and five 'Josef Stalin' without loss. Thus evidence was provided that the 'Josef Stalin' can be destroyed by the StuK 40 L/48 firing PzGr 39 at ranges up to 700m, but it needs steady nerves, cold-blooded determination and dedicated tactical commitment. During the mission one could observe that the 'Josef Stalin', just like the T-34 is highly-flammable. Over heavy terrain the 'Josef Stalin' is very slow and not as agile as the T-34. Two *Sturmgeschütz* with well-trained and alert crews can easily cooperate to attack and destroy it. The *Sturmgeschütz* will have to change position after the third round is fired at the latest. The 'Josef Stalin's' slow rate of fire must be exploited.

Although this report shows that the heavily armoured JS-2 could be effectively attacked by *Sturmgeschütz*, their weaknesses became obvious.

The End in the West

Sturmgeschütz played a small and short, but nevertheless significant role in modern military history. Originally, the *Sturmartillerie* branch of the army was created as a mere support weapon to be subordinated under the former 'ruler' of the battlefield, the infantry.

The *Panzertruppe*, the German armoured forces, which were developed and established a few years after Adolf Hitler had seized power, were to be a challenge to all existing military structures from the past. Elderly officers, from divisional commanders to high-ranking officers in the military tried to retain all the structures and traditions with which they were familiar.

If the revolutionary concept of committing an independent force of tanks as a battle-deciding weapon proved to be correct, then it is sensible that the creation of an armoured support element for the infantry would follow. The decision could be questioned: Why was the tank not chosen for the task, a tank had rotatable turret? Why were *Sturmgeschütz* designed, developed and produced at considerable expense, despite their one fundamental shortcoming – the lack of a turret which made any action to the flank a slow and difficult?

The *Sturmartillerie* would soon prove to be a highly effective weapon in combat, not only in support of the infantry, but also for the dangerous task of breaking through an enemy's fortified positions. As the war progressed, *Sturmgeschütz* were deployed for more and more demanding tasks. During 1941 in Russia, combat against massed, often superior, Soviet tanks became an urgent task which they accomplished with remarkable success. *Sturmgeschütz*, much like the PzKpfw VI Tiger tank, were feared by Soviet tank crews. Many German after-action reports dealing with attacks by Russian tanks note that many turned away on sighting a *Sturmgeschütz*.

German officials kept detailed and reliable statistics. In October 1944, the *General der Artillerie* published tabular material to confirm combat success by the *Sturmartillerie* on the Eastern Front. During the period January to August 1944, an average of 40 *Sturmgeschütz-Brigaden* had been involved in combat. The loss/kill ratio varied from one in three (March) to one in 14 (January). From June 1941 to August 1944, the total number of enemy tanks destroyed in the east was 18,262.

	January 44	February 44	March 44	April 44	May 44	June 44	July 44	August 44
StuG ready for combat	671	718	511	533	732	757	909	654
Total kills	860	429	578	542	147	245	1,019	847
Total losses	61	71	177	121	15	34	138	96

Unfortunately, the *General der Artillerie* did not keep comparable statistics for *Sturmartillerie* involvement in *Fall Gelb* (Plan Yellow), the invasion of the Low Countries and France, or for the Italian front. However, the author has a vague idea for an explanation. The information given in the war diary was certainly used to promote the interests of the artillery. While the *Sturmgeschütz* did extremely well in the east, the situation on the other fronts was completely

different. Is it possible that negative news was not communicated, while any success was widely announced for the greatest effect.

However, the numbers of victories scored by *Sturmgeschütz* during fighting in the east were extraordinary. The main reason for this success was as follows:

The Soviet Union was a country of vast open plains (steppes), which in many regions were ideal for massed tank attacks. With the introduction of the *Selbstfahrlafette-Zielenfernrohr* (Sfl-ZF) gun sight, *Sturmgeschütz* were able to fight enemy tanks at long range, despite having limited traverse. This ability remained until later in the war, despite having inferior armour protection and firepower.

- The *esprit de corps* among members of the *Sturmartillerie* was outstanding. Training and leadership were apparently very good.
- The German tactics on the battlefront proved to be far superior; especially in the east.

A *Sturmgeschütz* Ausf G of HStuArtBrig 905 destroyed near Heiderscheid in north-west Luxembourg, shortly after the failure of Operation *Wacht am Rhein* (Watch on the Rhine), the Ardennes offensive. Behind the *Sturmgeschütz* is a wrecked 2cm-armed SdKfz 251 *mittlerer gepanzerter Schützenpanzerwagen* (m gep SPW – armoured halftrack). It is unknown whether HStuArtBrig 905 had been equipped as a 'new-style' StuGBeglBttr, but it possibly has due to the presence of an SdKfz 251. (NARA)

After the Allied invasions of Italy and France, German forces were confronted with a new breed of soldier who was disciplined, well trained and armed with modern weapons. Another important factor was that Allied air forces virtually dominated the skies over the battlefront. While these aspects were of concern to all German forces, operations using the *Sturmgeschütz* and *Jagdpanzer* (both turretless) were severely hampered when fighting along the narrow rock-strewn roads in the mountains of Italy or in the *Bocage* (hedgerow) countryside of northern France.

The end of the World War II also brought an end to the concept of the *Sturmartillerie*. Ironically, this was actually instigated by the Germans when they introduced a new branch of service, the *Panzergrenadiertruppe* (armoured infantry). This new force was equipped with powerful and efficient *Schützenpanzerwagen* (armoured halftrack vehicles), armed with a variety of light and heavy weapons, which made the *Sturmartillerie* almost obsolete as a support branch.

However, stories of *Sturmartillerie* remain: Stories of bravery and reliability, of effectiveness and success.

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